Taking Action Toward Inclusion: Organizational Change and the Inclusion of People with Disabilities in Museum Learning

Author: Christine Ann Reich

BOSTON COLLEGE

Lynch School of Education

Department of
Curriculum and Instruction

TAKING ACTION TOWARD INCLUSION: ORGANIZATIONAL CHANGE AND THE INCLUSION OF PEOPLE WITH DISABILITIES IN MUSEUM LEARNING

Dissertation
By

CHRISTINE A. REICH

submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

May 2014

Abstract

Taking Action Toward Inclusion:

Organizational Change and the Inclusion of People with Disabilities in Museum Learning

Christine A. Reich, Author

Richard Jackson, Ed.D, Dissertation Chair

This study examined organizational change in science museums toward practices that are inclusive of people with disabilities. Guided by two overarching frameworks, organizational learning and the social model of disability, this study sought to answer the following: What are the contexts and processes that facilitate, sustain, or impede a science museum's change toward practices that are inclusive of people with disabilities? The research orientation was a qualitative, multiple case study. The cases featured three science museums that varied in size and location, but shared a documented history of efforts to include people with disabilities. Data were collected through observations and interviews with people with disabilities, interviews with staff members, observations of museum work, and documentation. Data analysis focused on generating descriptions and interpretation of the individual cases and the collection of cases.

Findings demonstrate that change toward inclusion in these three museums is an on-going process that is embedded within the work of a broad range of organizational areas. Findings also suggest actions science museums can take to facilitate change toward inclusion, including involving people with disabilities in organizational work, engaging in experimentation and reflection, promoting the idea that practices that benefit people with disabilities also improve the museum for others, and embedding information about inclusive practices into internal communication, professional development, and large

projects. These actions appear to promote organizational learning and sustainment of inclusive practices by concretizing the purpose of inclusion, developing staff who serve as internal resources, providing mechanisms for on-going feedback, and raising staff awareness of the importance of inclusion.

Preface

As this study was conducted within a qualitative research paradigm, I feel it is important that the reader understand who I am as a researcher and the multiple lenses through which I view the data and findings of this study. I come to this study not just as a doctoral candidate, but also as a researcher who holds a position within a science museum, an advocate for the inclusion of people with disabilities, and a leader who wants to learn more about ways to successfully facilitate organizational change toward more inclusive practices. For me, therefore, this study is not simply an academic pursuit. My desire is that the findings from this study will inform science museum professionals as we think about ways to make their own museums more inclusive of people with disabilities.

Sixteen years ago, at the age of 24, I was given a great gift: Betty Davidson, Ph.D. became my mentor. Betty Davidson is a remarkable woman whose work has shaped the inclusion of people with disabilities in science museums across the country. A passionate informal science education professional, Betty deeply believes that science museums play a meaningful role in society as places where *everyone* can learn about science, technology, engineering, and mathematics. As a lifelong wheelchair/cane user, Betty is also intimately familiar with the sting of exclusion.

In the late 1980's, Betty changed how the Museum of Science, Boston (where I currently work) developed its exhibitions so that the inclusion of people with disabilities and universal design became core organizational values. I interned with Betty Davidson in the 1990's. When Betty decided to retire in the early 2000's, I inherited her informal designation as an advocate for the inclusion of people with disabilities at the Museum.

Since Betty's retirement, my career has taken many twists and turns. I no longer work for the Exhibits Department, but instead lead the Museum's Research and Evaluation Department. Despite this shift, a focus on the inclusion of people with disabilities and my commitment to upholding Betty's legacy remain with me. Each year, the Research and Evaluation Department conducts multiple studies that examine ways to create museum environments that are more inclusive of people with disabilities. I have also shifted from being less of a mentee to more of a mentor, helping others (whether at the Museum of Science or at other museums across the United States) to engage in practices that are more inclusive of people with disabilities. Another change is that I am no longer the informally designated advocate, but instead have become the formal co-leader of the Accessibility Committee at the Museum of Science.

As an advocate, the decision to focus on *change in practice* rather than *innovations in practice* is a strategic one. While many designs and technological innovations have been developed over the years to create museum environments that are more inclusive of people with disabilities, few have been consistently adopted or applied. I believe, therefore, that creating museum environments that are more inclusive of people with disabilities requires not just new knowledge or designs, but changes in how we as science museum professionals fundamentally conceive of our work.

My positionality as a researcher can best be described as an external/insider for this study. During the course of my career, I have worked closely with many science museums across the country, including the three that are the focus of this study. Hence, I was never truly an outsider when I was gathering, analyzing, or interpreting the study's

data. I am also an external/insider when it comes to my disability status. I was not raised in a culture of disability, and do not self-identify as a person with a disability. Over the years, however, I have developed many close relationships with mentors and fellow advocates who have lived with disability and I have come to accept the disability rights causes as my own. I have also come to understand that we all exist along a spectrum of able-to-disable (especially as a 5'1" female who wears glasses), and that ableness is temporary (like many others, I too have experienced injuries that required the use of walkers and other assistive devices for brief periods of time).

These are the lenses through which I view the findings of this study: as an external/insider to both disability and the participating science museums; an internal researcher who is focused on studies that inform the work of one specific science museum; and as an advocate and leader for change toward inclusion of people with disabilities who is looking to strengthen her own practice. I hope this explanation of who I am informs and guides your reading and interpretation of this study.

Acknowledgements

Given the varied life experiences that brought me to pursue this topic of investigation, it is perhaps not surprising that I am indebted to many individuals for the inspiration and support they provided to enable the completion of this study. As a doctoral student, I have been greatly inspired by the commitment to social justice that permeates all aspects of the Lynch School of Education at Boston College. Every course I took instilled in me the importance of ensuring that all students are provided access to learning. As a long-time advocate for greater commitment to social justice within science

museums, the supportive atmosphere of the Lynch School of Education gave me the strength to be a stronger advocate within my professional life. I will greatly miss that source of support as I move forward in my career.

Each member of my doctoral committee has shaped my thinking as a scholar. Dr. Andrew Hargreaves first introduced me to the concept of studying educational change, and Dr. Patrick McQuillan instilled in me a sense of what it means to conduct rigorous qualitative research. Dr. George Hein was one of the first individuals to teach me about museum education research many years ago, and he was also the person who most encouraged me to make the inclusion of people with disabilities the focal point of my research ("If you don't focus on this, who will?" he asked me over 10 years ago). Dr. Richard Jackson has provided a strong sense of support throughout my career as a doctoral student. His pragmatic orientation and commitment to ensuring that students with disabilities are provided access to learning has been and will continue to be a source of inspiration for me as a researcher.

As a practitioner and science museum professional, there are also many people to thank at the Museum of Science, Boston. Many colleagues provided me with the time and space to work on this study as a part of my Museum work, including (but not limited to) Larry Bell, Elizabeth Kunz Kollmann, Ryan Auster, Clara Cahill, and Andrea Durham. Anna Lindgren-Streicher and Juli Goss also served an additional role as thinking partners. The time they spent discussing this project with me certainly helped to clarify my thinking. Numerous Research Assistants and Assistant Researchers at the Museum of Science also supported this research by organizing data, transcribing interviews, copy-

editing quotes and drafts, and contacting participants for member checks. They include Leigh Ann Mesiti, Marta Beyer, Stephanie Iacovelli, Catherine Lussenhop, Sune Chunhasuwan, Amanda Colligan, and Sarah May.

Beyond professionals working at the Museum of Science, other museum professionals from across the nation also contributed to this study. Many fellow advocates served as advisors and peer reviewers, including Beth Ziebarth, Valerie Fletcher, Beverly Sheppard, Nina Levent, Joan Pursley, Rebecca McGinnis, Hannah Goodwin, David Ellis, Ph.D., George Hein, Ph.D. (dual role as advisor and committee member), and Terrie Nolinski, Ph.D. Numerous professionals and visitors at the three participating museums volunteered their time to participate in this study, although due to ethical considerations, they must remain unnamed. Despite their anonymity, their thoughts and insights were invaluable. Additionally, certain individuals at each museum served as key informants and coordinators, taking the time to arrange for the various observations and interviews that generated data for this study. Although I cannot list their names here, I would like them to know that I greatly appreciate their time and commitment to this study. Their demonstrated altruism— engaging in this work anonymously for the purpose of advancing greater inclusion of people with disabilities within science museums—is laudable. Amongst all of the science museum professionals who supported this work, however, there is one to whom I am most indebted: my good friend and mentor, Betty Davidson, Ph.D. Not only did she serve as an advisor for this project, but she continues to guide me down this path of advocacy from which I will never veer.

Finally, it has been the support of my family that I have most valued over the years. My parents, Frank and Deborah Taverna, have continually reassured me that I will "get it done." Their confidence in my abilities has always been a source of strength. My son, Teddy, has provided me with his stress-relieving smiles and giggles that helped me through the last round of edits (even if his birth a year ago was also a source of some delay). Most importantly, I must thank my wonderful husband, Stephen Reich, whose work in the background (making meals, maintaining the house, and amongst many other tasks) has enabled me to focus so much on my professional and academic career over the past few years. Without his daily supportive words and belief in my abilities, this study would not have been possible.

This project was made possible in part by the Institute of Museum and Library Services (LG-54-09-0053-09)

Table of Contents

List of Tables

Chapter 1: Introduction

Museums play an integral role in civic society. They are social institutions that reflect and shape the ideas and knowledge that are preserved and disseminated to current and future generations (Janes & Conaty, 2005). Hence, what a museum presents as worthy content and who the museum considers to be part of its visiting public communicates a message about what and who are legitimate parts of "normal" society. Given this, museums play a critical role in the struggle for disability rights and inclusion. If people with disabilities are excluded from museums, it reinforces existing ableist notions that people with disabilities are somehow "other" (Hehir, 2002). Conversely, inclusion of people with disabilities in museums is an important indicator that people with disabilities are a part of normal society.

In addition to their role as social institutions, museums are also learning institutions. They are one of the few physical places members of the public can visit to engage in informal learning. Students with disabilities currently participate less in out-of-school-time learning experiences than students without disabilities (Wagner et al., 2002). Such decreased participation is significant given that informal learning not only supports the learning that takes place in the classroom, but also plays a critical role in fostering and promoting lifelong learning (National Research Council, 2009, p. 127). Exclusion from informal learning experiences, therefore, not only has the potential to place students with disabilities at a disadvantage within the classroom (Roald, 2002), but also potentially contributes to educational disadvantages throughout the lifespan.

Although museums have made great strides in the last 20 years to become more inclusive, the inclusion of people with disabilities in museum learning is still a specialized rather than a normalized practice. According to a science museum poll, the majority of science museum professionals feel that less than half of their exhibitions are accessible to people of a broad range of disabilities (Tokar, 2004). Furthermore, a survey of all US museums found that less than 25% have accessibility plans related to technology (Institute of Museum and Library Services, 2006). While these statistics may appear low, they are likely overestimates as each survey relied on self-reported estimates of inclusion. Walters (2009) found in her survey of US and UK institutions that there was a discrepancy between whether an institution felt they achieved full or partial access for people with disabilities and the actual access policies, programs, or practices that were in place. These findings are supported by a recent report that documents actions museums are taking or not taking to include people with disabilities in informal science learning, which found that only a handful of institutions are responsible for the majority of inclusive programs and exhibits created by science museums (Reich, Price, Rubin, & Steiner, 2010).

Studies looking specifically at museum content and collections further confirm continued and widespread exclusion of people with disabilities. Systematic reviews of museum collections have repeatedly shown that representations of disability were either absent in the collections (even in the portraits of famous people who are known to have disabilities) or portrayed people with disabilities as sick or freaks (Allday, 2009; Delin, 2002; Sandell, Delin, Dodd, & Gay, 2005). Furthermore, some museums have actively

excluded from their exhibitions content that presented disability as a culture as opposed to a defect (Bergey, 2008).

The exclusion of people with disabilities from both museum content and practices may explain why people with disabilities believe museums are currently exclusionary institutions. Studies of accessible art museum programs specifically targeting visitors who are blind or have low vision found that people with visual disabilities continue to feel excluded from learning in art museums (Buyurgan, 2009; Hetherington, 2003; Reich et al., 2011), thus concluding that "without institutional change, educational events for the blind will continue to be an inadequate supplement to a structure that is and remains inequitable" (Candlin, 2003, p. 100). Furthermore, additional studies found that visitors of all kinds of disabilities report numerous barriers to full participation in museum offerings including the following: the design of the museum's facilities, exhibits, and programs; untrained or unhelpful staff members; and the absence of disabilities in museum content and collections (Dodd, Hooper-Greenhill, Delin, & Jones, 2006; Landman, Fishburn, Kelly, & Tonkin, 2005; Poria, Reichel, & Brandt, 2009).

The continued exclusion of people with disabilities from museum learning reflects neither the absence of legislation mandating museums become more inclusive nor the lack of effort on the part of museum professional organizations to raise awareness of the need for inclusion. Legislation in countries such as the United Kingdom, the United States, and Australia, mandates the inclusion of people with disabilities in museum learning, yet this legislation is not always adhered to. In the United States, the Americans with Disabilities Act and Section 504 of the Vocational Rehabilitation Act require that

museums be accessible to people with disabilities. The extension of this legislation to include a museum's educational offerings was confirmed in a Department of Justice settlement, which found the International Spy Museum in violation of Section III of the Americans with Disabilities Act since visitors with visual impairments were not provided full access to the Museum's exhibits and programs (Department of Justice, 2008).

There have also been many field-wide initiatives that have pushed museums to reconsider the accessibility of the programs, exhibits, and facilities they offer. Noteworthy examples include the American Association of Museum's (AAM) *Everyone's Welcome* initiative (AAM, 1998), the Association of Science-Technology Center's (ASTC) *Accessible Practices* initiative (ASTC, 2000), and the University of Leicester's *Rethinking Disability Representation in Museums and Galleries* project (Dodd, Sandell, Jolly, & Jones, 2008). Despite such efforts, the field in many ways remains unmoved. For example, although the *Accessible Practices* summative evaluation found that the effort resulted in an increase in the number of conference presentations related to accessibility during the 2002 and 2003 ASTC annual conferences (Hein, 2002, 2003), by 2008, this trend was reversed; none of the presentations during the 2007 ASTC annual conference addressed this topic, and only one presentation discussed people with disabilities in each of the 2006 and 2008 conferences.

Although people with disabilities are frequently excluded from museum learning experiences, there are many exceptions. Some museums have recently made efforts to alter the design and development of museum learning experiences (such as exhibits, programs, and media) to be more inclusive. Evaluations have found that people with

disabilities can learn and benefit from inclusive learning experiences, whether they focus on art, science, or history (Chin & Lindgren-Streicher, 2007; Cohen & Heinecke, 2004; Ellenbogen, 2007; Giusti & Landau, 2004; Karp & Leblang, 2004; Kirk, 2001; Onol, 2008; Rapp, 2005; Rhoads, 2009; C. E. Tisdal, 2007). Additional studies also found that museum exhibits designed for people with disabilities can offer increased learning opportunities for museum visitors without disabilities (Basham, Meyer, & Perry, 2010; Davidson, Heald, & Hein, 1991; Reich, 2006a).

Given that some museums have successfully created learning environments that are inclusive of people with disabilities, the problem does not appear to be the incompatibility between people with disabilities and museums, but instead the incompatibility between current museum practices and the needs of people with disabilities. This problem statement matches the social model of disability, which supports the notion that barriers to participation by people with disabilities derive from society's response to human differentiation rather than the deficiencies of the individual (Barnes, 1998; Barton & Armstrong, 2001; L. Davis, 2001; Gill, 1999; McDermott, 1996; McDermott & Varenne, 1995).

The social model of disability presupposes that enhanced participation in museum education by people with disabilities is achieved when those who design museum educational experiences take action to ensure those experiences are inclusive of people with disabilities. If museums are to move forward in this area, therefore, the field needs to gain a better understanding of the contexts and processes that enable and prevent a change toward and sustainment of more inclusive practices.

Museums and Change

Museums, as institutions founded for purposes of collecting and preserving, are not known as being responsive to change. In fact, change in museums has been described as resulting from traumatic events that cut at the very fabric of who these institutions perceive themselves to be. As written by Elieli and Gould (1995, p. 27), "When is a change considered a trauma, particularly in an institution like a museum whose objective is to preserve permanence and memory? In such an organization, every change will seem traumatic." Others theorize that it is not possible for museums to substantially change after they have been established and that the best way to facilitate a change is to found a new kind of institution or field (DiMaggio, 1991; Ogawa, Loomis, & Crain, 2008). This notion of change in museums as impossible or traumatic at best can leave inclusion advocates feeling hopeless and defeated.

There is reason, however, for such advocates to remain optimistic. Despite their reputation as static and unchanging, museums have changed over the years. For example, many museums have experienced a dramatic shift in their overall mission and purpose. While before they viewed themselves as focused on collecting and preserving, they now also view their purpose as one of interpreting and educating (Hirzy, 1992). This is best exemplified in the current definition of a museum as written by the American Association of Museums (AAM):

> Museums make their unique contribution to the public by collecting, preserving, and interpreting the things of this world. . . . Their missions include collecting and preserving, as well as exhibiting and educating with

> materials not only owned but also borrowed and fabricated for these ends. . . .The museum universe in the United States includes both collecting and noncollecting institutions. Although diverse in their missions, they have in common their nonprofit form of organization and a commitment of service to the public. (AAM, 2000)

This shift towards more public-focused institutions has led to changes in how museum exhibitions are developed (Roberts, 1997), how museums are directed (Suchy, 2004), and how museum leaders seek to define success (D. Griffin, 2008). In addition to the changes that have taken place within the museum field as a whole, individual institutions have also been known to adopt whole new educational practices (J. Griffin et al., 2007), and to develop new visions for the role they wish to play in their community (AAM, 2002). Certain well-funded, multi-organizational initiatives have been known to have a sustained effect on a broad range of museum programming and offerings (C. K. Brown, 2006), including science museums (Sneider & Burke, 2011).

While it is well-documented that change can occur within museums, the contexts and processes that facilitate or detract from change are only just recently being studied. Previously, what had been known about change in museums came from personal accounts that described change as experienced by museum professionals (Gurian, 1995; Hirsch & Silverman, 2000). While insightful, these accounts did not present a strong description of the contexts and processes that contribute to or detract from change.

More recently, a few empirical studies have been conducted that looked at change in museums. One series of studies that examined change from the perspective of museum

management found that change toward more visitor-focused and effective practices stems from a participative style of leadership where formal institutional leaders demonstrate a concern for quality, good communication with staff members, and establish a shared sense of goals (Abraham, Griffin, & Crawford, 1999; D. Griffin, Abraham, & Crawford, 1999). Another study of change in history museums highlighted, however, that CEO's and other senior leaders are not the only individuals who can initiate change; change agents can be found in all levels and in all areas of an organization (Tangorra Matelic, 2008). This study, which specifically looked at history museums, further supports the idea that change in museums can be traumatic and emotional for the staff members involved. Drawing from interviews conducted with history museum professionals and organizational change research and theories from outside of the museum, findings from this research also reveal, however, that change is possible and can be successful when supported through a process that involves attending to the emotions of staff members, focusing on transformational leadership, intensely involving multiple stakeholders, and fostering organizational learning.

Given the limited scholarship around change in museums, how can the field begin to understand the contexts and processes that influence whether a change toward greater inclusion of people with disabilities takes hold within an organization, and how those contexts and processes shape the change that is implemented?

Research Question

The purpose of this research study is to generate an enhanced understanding of the contexts and learning processes that sustain or detract from a change toward more

inclusive educational practices in museums. This study draws from two frameworks, including the social model of disability and organizational learning.

The social model of disability serves as a lens for viewing the inclusion of people with disabilities in museum learning. The social model supports the notion that barriers to participation by persons with disabilities derive from society's response to human differentiation rather than the deficiencies of the individual (Barton & Armstrong, 2001; L. Davis, 2001; Gill, 1999; McDermott, 1996; McDermott & Varenne, 1995). This model presupposes that enhanced participation in museum education by people with disabilities is achieved when those who design museum educational experiences work and interact with people with disabilities in meaningful ways (Hollins, 2010).

Organizational learning serves as a lens for studying organizational change. Organizational learning is based on an understanding that organizations, like individuals, are capable of learning and it is through such learning that new structures, systems, processes, knowledge, beliefs, and practices can be developed (Argyris & Schon, 1974). Organizational learning is based on an underlying assumption that organizations are open, complex systems that are held together by the shared understandings and cultures amongst its members (Scott, 2003).

Combined, the social model of disability and organizational learning frameworks provide ways of viewing the why, what, and how of science museum change toward inclusion. This research study, therefore, examines the following questions: *What are the contexts and learning processes that facilitate, sustain, or detract from a museum's*

change toward more inclusive practices? How do these learning processes and the museum contexts influence the kinds of change that take place?

Chapter 2: Literature Review

Understanding change toward the inclusion of people with disabilities in science museums requires a conceptual framework that defines the following: 1) disability and its meaning within a broader society, and 2) the process through which organizational change can transpire. As stated in the introduction, this study is grounded in an understanding of disability as a social construct and change as a process that occurs through organizational learning. This literature review looks at the intersections of these two theories by beginning with an explication of each. It then describes prior empirical studies that examined change toward inclusion across a variety of organizations, including schools, museums, non-profit organizations, and corporations, and interprets findings across these studies from the perspective of the two guiding frameworks. From this analysis, a beginning framework is formed, which serves as a starting point for the investigation of change toward greater inclusion of people with disabilities in three science museums across the United States.

The Social Model of Disability and its Meaning for Organizational Change

The message "Not for you" is endemic to life with a disability. People with disabilities are frequently excluded from full participation in society based on the pervasive barriers that exist within the practices, cultures, and structures of social institutions. The effects of such exclusion can be found in statistics that describe how people with disabilities are less likely to be employed and more likely to live in poverty than their non-disabled peers (Waldrop & Stern, 2003), as well as in the personal accounts of people with disabilities who report feeling undignified and dependent in

museums (Landman et al., 2005), segregated and "different" in school settings (Diez, 2010; Solis, 2006), and freakish when viewing artistic depictions of disability (Delin, 2002; Hevey, 2010).

Disability studies scholars posit that the existence of such exclusion reflects society's response to human difference, which results in designs, systems, practices, and processes that are based on unstated assumptions of what it means to be "normal." Failure to acknowledge human variation leads to the development of public and private institutions that are open and accessible for some individuals, but exclude others (L. J. Davis, 2010; Freund, 2001; Schriner, 2001). The notion that community and societal inclusion stems from changes within societal institutions rather than changes to characteristics of individuals is called the social model of disability (Barnes, 1998; Shakespeare, 2010). It is a radical departure from the traditional, medical model which defines disability as a medical defect that should be treated or fixed. Disability studies scholars argue that the medical model of disability leads to "ableism" and a denial of rights that coincides with the notion that persons with disabilities are somehow "other" (Gill, 1999; Hehir, 2002; Smith, 2001). The social model of disability, in contrast, places the responsibility for change within society.

The social model of disability has implications for how one thinks about and defines education for people with disabilities (Baglieri & Knopf, 2004). Many have argued that the very idea of "special education" is based on medical assumptions of disability, and what is needed is movement away from the deficit framework where the barrier to learning is thought to reside within the student (Skrtic, 1991). Instead, such

scholars advocate for a social constructivist model of learning, where the disability is presumed to result from the interactions of the individual within a specific context (Lipsky & Gartner, 1996; Trent, Artiles, & Englert, 1998). The notion that the ability to learn is contextual, and that all learners can do extremely well in some environments yet fail in others, is also shared amongst those who advocate for culturally-based understanding of disability education (Dudley-Marling, 2004; McDermott, 1996; McDermott & Varenne, 1995) as well as individuals who promote universal design for learning (Rose & Meyer, 2002).

Those who align themselves with the social model of disability perspective of education advocate for a model of inclusion. While some define inclusion in terms of student placement (Kavale & Mostert, 2003), others argue that the term inclusion has greater social meaning and requires a more substantial shift than the placement of students alone. Barton and Armstrong (2001) define inclusive education "not as an end itself but a means to an end—that of the realization of an inclusive society" (p. 708). Ainscow and Miles (2008) further state that inclusion in formal education requires

> . . . new thinking that challenges deeply ingrained assumptions among many educators across the world. Specifically, it requires a move away from explanations of educational failure that concentrate on the characteristics of individual children and their families, towards an analysis of the barriers to participation and learning experienced by students within education systems. (p. 21)

Inclusion takes on further meaning in informal learning environments such as museums where learners can chose how they learn, what they learn, and with whom they learn (Falk & Dierking, 2000). While some museums offer distinct programming for people with disabilities, the people who visit museums often attend in mixed ability groupings (Landman et al., 2005; Poria et al., 2009). Inclusion in science museums has been defined as follows:

> Inclusion in [informal science education] goes further than ensuring that people with disabilities can enter the buildings or use the exhibits, programs, and technologies that deliver such experiences. It also requires that people with disabilities are able to learn from such experiences and participate as a part of, and not separate from, the larger social group and community. (Reich et al., 2010, p. 10)

Beyond issues related to education, the social model of disability also provides a distinct framework for understanding change in organizations. According to this model, the inclusion of people with disabilities can only stem from a change in current values, beliefs, cultures, practices, and ways of thinking as it is the current standards of organizations and social institutions that lead to situations where individuals are "dis-able" to fully participate in society. The social model, therefore, necessitates the study of organizations, including how they react to notions of disability and the context and processes that promote a change in practice, knowledge, attitudes, beliefs, and cultures within those organizations. The social model of disability has been put forth as a meaningful way for understanding and advocating for change toward inclusion by

scholars across a range of disciplines, including schools (Ainscow & Miles, 2008), recreational organizations (Tregaskis, 2004), and corporations (England, 2003).

While the social model of disability holds great promise for studying organizational change toward inclusion, it also poses potential limitations. The utilization of the social model of disability for studying organizational change does not correspond with traditional notions of social model of disability research, which tends to be emancipatory in focus and encourages deep and active involvement of people with disabilities in all research phases (Barnes, 2003; Bricher, 2000; Campbell, 2000; Gill, 1999; Walmsley, 2001). Some disability studies scholars, however, advocate the need for a broader range of research styles, stating that the traditional "us versus them" rhetoric of the disability rights movement limits the number of researchers who can study the barriers that prevent changes toward inclusion and also fails to acknowledge the diversity of perspectives and viewpoints that exist within both disabled and able-bodied populations (S. C. Brown, 2001; Humphrey, 2000; Schriner, 2001). Such scholars also state that movement away from traditional, emancipatory studies of disability could widen the range of research questions asked within the framework of the social model of disability. Emancipatory studies tend to examine the experiences of people with disabilities, yet there is also a need to study the systems, processes, and procedures of those who are in power and are most likely to take the actions needed for change (J. M. Davis, 2000).

The social model of disability has also been criticized for its exclusive focus on societal barriers, while ignoring other factors such as the meaningful impact health

impairments can have on an individual (Shakespeare, 2010; Simmons, Blackmore, & Bayliss, 2008; Williams, 2001), and the role of other social forces (Mawyer, 2005). When studying organizational change, a further limitation of the social model of disability is its exclusive focus on the *why* of change rather than the *what* or *how*. For this reason, the social model of disability is perhaps most suited for studying organizational change when coupled with an additional theory that provides further insights on how change is facilitated, such as organizational learning.

Organizational Learning as a Way of Understanding the Process of Change

Learning had historically been thought of as an individual process, an activity that leads to changes in the way one thinks, acts, behaves, and feels. Learning, however, has come to be understood as a process that can be ascribed to whole organizations as well as to the individuals who comprise them (Levitt & March, 1988; March & Olsen, 1975). Such learning is a critical component for understanding organizational change, especially a change such as inclusion that requires individuals to reconsider long-held values and beliefs about what it means to be a normal learner and what usual practices should be.

Organizational learning is thought to have individual, community, and organization-level dimensions (Mulford, 1998). Some view organizational learning as the collective learning of the individuals who comprise an organization, and express that evidence of organizational learning can be found in the shared thoughts, ideas, processes, and beliefs that extend across individuals (Weick, Sutcliffe, & Obstfeld, 2005). Others describe organizational learning as more than just the sum of individual learning, citing that knowledge generated through organizational learning can become ingrained within

the organization's memory and persist beyond the organizational life span of any one group of individuals (Levitt & March, 1988; Yanow, 2007).

Organizational change stems from a process of organizational learning, as it is through learning that new structures, systems, processes, knowledge, beliefs, and practices can be developed (Argyris & Schon, 1974). This notion of change is tightly coupled with understandings of professional knowledge and practice that view such knowledge and practice as being interrelated and cyclical, with each stemming from and contributing to the other (Argyris, Putnam, & McLain Smith, 1990; Cochran-Smith & Lytle, 1999; Gherardi, 2000; Schon, 1983).

Some scholars postulate that organizational learning leads to positive change as it enables organizations to better adapt to their changing environments (Senge, 1990). Others assert, however, that both positive and negative change can result from organizational learning (Huber, 1991). As with individuals, organizational learning can lead to the development of both positive and negative behaviors. For example, a teenager learns and adopts a habit of smoking just as readily as he/she learns to engage in a proper exercise routine. The same is true for organizations, which can also learn new practices that are potentially harmful to their long-term health. As stated by Argyris and Schon (1999, p. 948), ". . . we cannot escape the need to declare what kinds of organizational learning will take to be desirable or undesirable and why." This highlights the importance of coupling organizational learning with the social model of disability *so that the how* of change can be understood within the context of *why*.

The debate concerning whether evidence of organizational learning can be seen in all kinds of change is related to the distinction that authors Argyris and Schon (1999) and Robinson (2001) make between scholarship that *describes* organizational learning as a process that leads to change and scholarship that *prescribes* organizational learning as a remedy for fostering positive change. While the former focuses on using organizational learning as a lens for viewing whether and how change takes place, the latter is associated with studies that examine a specific kind of change—change toward becoming a learning organization (Argyris & Schon, 1995; Senge, 1990).

Within the field of educational research, studies have examined organizational learning from both a prescriptive and descriptive lens. For example, while some scholars have used organizational learning as a way of understanding the processes that facilitate or pose barriers to specific kinds of educational reform (for example, Fauske & Raybould, 2005; Honig, 2004; Ingram, Louis, & Schroeder, 2004), others have established frameworks for creating schools that exemplify the ideal of a learning organization (for example, Collinson, Cook, & Conley, 2006; Fullan, 1995), and still others have studied how schools that exemplify the notion of a learning organization respond to their external environment (for example, Giles & Hargreaves, 2006). While these varying strands of research are all worthwhile, this study uses organizational learning as a way of describing the context and process that lead science museums to change and adopt inclusive educational practices. It does not seek to study whether or not science museums are learning organizations. Therefore, this study is more closely related to scholarship that is more descriptive than prescriptive in focus.

The process behind organizational learning is on-going and iterative. Organizational learning stems from organizational members' attempts to make meaning of their daily experiences, through a process of sense-making where they continuously apply meaning and interpretations to what they experience through everyday practice (Weick et al., 2005). Such co-constructed learning is generated through the frequent and changing interactions of the individuals who comprise an organization (Weick, 2000). As stated by Argyris and Schon (1999, p. 944)

> . . . a theory of organizational learning must take account of the interplay between the actions and interactions of individuals and the actions and interactions of higher-level organizational entities such as departments, divisions, or groups of managers. Unless a theory of organizational learning satisfies this criterion, it cannot contribute to knowledge useful to practitioners of organizational learning; nor can it explain the phenomena that underlie observed limitations to organizational learning.

A necessary component of any study on organizational learning must therefore examine the interactions that occur between the individuals and various components of an organization, and how such interactions foster and contribute to the co-construction of new knowledge, values, beliefs, and practices within it.

Through his literature review, Huber (1991) developed a framework for categorizing the processes and interactions that have been found to facilitate organizational learning. These include the following: "congenital learning" (p. 91), defined as what the organization learns based on its origins; "experimental learning" (p.

91), which relates to what an organization learns through experimentation and testing of new ideas and theories; "vicarious learning" (p. 96), which relates to attempts to learn from the work of other organizations; "grafting" (p. 97), where an organization learns through the acquisition of new employees who bring new perspectives; and "searching and noticing" (p. 97), where an organization learns by seeking out specific insights that may be held in its internal or external environment. Such descriptions highlight the idea that the interactions that facilitate organizational learning do not always take place within the organization's walls. In some cases, such interactions take place between existing members of the organization and its external environment through processes such as acquiring new employees, searching for information, and interacting with other organizations of its kind. In addition, Huber also describes processes that are intentional, such as purposeful experimentation and testing of new ideas, as well as unintentional, such as the learning that takes place based on the organization's origins.

Huber's processes focus largely on the cognitive aspects of learning such as knowledge acquisition and organizational memory. Learning, however, is more than the acquisition of knowledge; simply learning new content will not always lead to changes in behaviors. For example, just because a teenager knows that smoking can kill and exercise is healthy, this does not mean the teenager will not smoke and will exercise instead. Some organizational learning scholars, such as Yanow (2007), have advocated that the concept of organizational learning should be extended to include non-cognitive dimensions of learning, such as interests, values, beliefs, practices, and behaviors. This broadened theory of learning aligns with notions of learning in informal science learning

environments, such as museums, where multiple dimensions of science learning have been identified, including learning related to interests, identities, engagement, discourse, and skills, as well as knowledge and understandings (National Research Council, 2009). It also connects to the social model of disability, which advocates for change that extends beyond knowledge and understanding about people with disabilities to include new values and beliefs about what it means to be normal.

Argyris and Schon (1974) set forth that there are different degrees of change, and that certain change processes will more likely facilitate changes in values and goals than others. Single loop learning equates to small, iterative refinements made to the organization's existing conceptions and practices. Double loop learning, in contrast, is evident in changes that are made to entire value systems, beliefs, and ways of understanding. It is this later form of learning that is considered to align with more substantial organizational change as it leads to substantial change not only in practice but also in organizational goals. The authors postulate that double loop learning occurs when an organization detects a difference between its theory of action (the theory it explicitly states as being the one that drives its actions) and its theory in use (what is concretized through actual practice).

While the distinction between single and double loop learning offers an important way of understanding the depth of change, it does not offer a way of considering the extent of change within an organization. In his review, Huber (1991) presents a framework for studying the extent to which an organization learns and will sustain what it learns from a breadth, elaborateness, and thoroughness perspective. According to Huber,

> . . . more organizational learning occurs when more of the organization's components obtain this knowledge and recognize it as potentially useful. . . more and more varied interpretations are developed . . . [and] more organizational units develop uniform comprehensions of the various interpretations. (p. 90)

From this description of successful organizational learning, one can see how such learning can be measured from the perspective of its depth, breadth, and diversity within an organization, in addition to its depth with regards to the kind of change (small and iterative single loop learning versus larger and deeper double loop learning).

When considering how organizational learning can be applied to studying change toward inclusion, one must remember that organizational learning depends on the topic that is the focus of the learning and the context within which such learning takes place (Robinson, 2001). Viewing organizational learning and change as it relates to a specific kind of change, a change toward inclusion in a science museum, requires that one not only understands organizational learning, but also what is known to facilitate or pose barriers to a change toward inclusion.

Prior Studies of Organizational Change Toward Inclusion of People with Disabilities.

While only a few evaluation studies have examined change toward inclusion in museums (Dodd, 2010; Hein, 2002, 2003; Sandell, 2003), other studies have been conducted across a range of fields that look specifically at organizational change from a

social model of disability perspective. These studies have examined changes toward inclusion across multiple kinds of organizations (including schools, corporations, and non-profit organizations) and can provide indications of the contexts and processes that could facilitate a change toward inclusion in museums.

A search of the literature was conducted in 2011 (just prior to the commencement of this study) to identify empirical studies that examined organizational change toward practices connected with the social model of disability. The purpose of this literature review was to generate a beginning hypothesis and framework that could subsequently be used to inform data analysis and interpretation.

This search utilized criteria previously established by Dyson, Howes and Roberts (2002) as a beginning framework for the selection criteria. Similar to Dyson et al. (2002), this review looked specifically at studies that examined change at the organization level, excluding those, therefore, that looked at change at the level of individual practice, policy, community, or broader society. While there is a connection between individual practice and organizational practice (Mulford, 1998), as well as a connection between organizational change and broader social movements (Zald, Morrill, & Hayagreeva, 2005), different mechanisms and strategies guide change at the individual, organizational, and societal level. Therefore, in an effort to identify those prior studies that would be the most pertinent to this current study, any study that did not explicitly address change toward inclusion at the organizational level was excluded.

Also similar to Dyson et al. (2002), this review focused on studies that addressed broad levels of inclusion, and excluded those that looked at the adoption of specific

inclusive practices (such as the utilization of team-teaching) and response to intervention in schools, or specific recruiting practices by businesses and non-profit organizations. Such institution-specific practices did not always connect to the social model of disability and notions of inclusion and were often inapplicable to museum practices. For example, given that the notion of special education is absent from museums, practices that stem from the special/general education dichotomy are not relevant to museums. Unlike Dyson et al. (2002), this review broadened its focus beyond inclusion in schools and also examined studies in other organization types such as businesses, museums, and other non-profits. This review in some ways also featured a more narrow focus than Dyson et al. (2002), as it looked specifically at inclusion as it relates to people with disabilities, while Dyson et al. (2002) looked at a change toward inclusion that addressed a broad range of learners.

This search was conducted through a mix of electronic searches, hand searches through bibliographic citations, and solicitations from researchers who were known to have conducted related studies (this was particularly true for museums). Electronic databases searched included ERIC, Informalscience.org, Academic OneFile, JSTOR, ASSIA, Google Scholar, Business Source Complete, and the Social Science Citation Index. Search terms included the following: social model of disability or disability rights or inclusion or universal design or inclusive education, and change or organization (depending upon the database). Articles extracted from these databases were limited to those in peer reviewed journals, except for studies related to museums where no studies related to change toward inclusion were located in peer-reviewed journals. Furthermore,

given the extensive number of studies found from the field of formal education, only those studies conducted since 1997 were included in this review as this year signifies changes to the Individuals with Disabilities Education Act that emphasized the inclusion of students with disabilities in general education, a law that corresponds more closely to the social model of disability than previous legislation. Although not pertinent to museums, this law is important for schools, the organization type for which the majority of studies were located.

Through this search, 25 empirical studies were identified that connected to the social model of disability and organizational change. While not all of the studies specifically identified the social model of disability as an overarching framework, each did address organizational changes that moved away from traditional practices that were exclusive of people with disability and towards those that would be more inclusive of a broader public, including people with disabilities.

Although the collection of 25 empirical studies looked at change toward inclusion across a range of institutions, formal education institutions (such as schools and universities) dominated the literature, with 19 of the identified 25 studies examining change toward inclusion in schools. In addition to the emphasis on schools, case study designs (21 of the 25 studies) were prevalent, and only a few of these studies (4) included data related to the perceptions of or outcomes for people with disabilities. Table 1 presents a summary of each empirical study identified through this review.

In addition to the 25 empirical studies, three literature reviews were also identified (Ainscow & Sandill, 2010; Dyson et al., 2002; Riehl, 2000). Although these

literature reviews focused on change toward inclusion in schools, they do provide a useful starting point for examining what is known about organizational processes and contexts that foster a change toward inclusion and yield insights on the kinds of conditions that might be discussed in the remaining empirical studies or found during this study's investigation.

Of the three literature reviews, Dyson et al., (2002) is the most useful, given the extensiveness of the investigation, the transparency of the review selection criteria and study summarization process, and its specificity related to organizational change toward inclusion in schools. Although this literature review was not published in its entirety in a peer reviewed journal, it is included in this review given these characteristics. The authors used a broad definition of inclusion that encompassed a broad range of students and not just students with disabilities. This review sought evidence that it is possible to create a school that is inclusive of a diverse range of students and to understand the link between school action, change, and student outcomes. Findings from this literature review suggest school characteristics that need to be attended to in order to promote the participation of a broad range of students in learning. These actions were identified as follows:

- "School cultures" (p. 45), where culture is defined as "the norms, values and accepted ways of doing things in schools." Across studies, there was an emphasis on attitudes and values, "cultures of collaboration" with teachers working with other teachers, parents, or student-to-student collaborations (p. 46), and "the

complexity of school cultures" where a change toward inclusion may not be consistent throughout (p. 47).

- "Leadership and decision-making" (p. 47), with strong formal leaders who are committed to the principles of inclusion, as well as distributed leadership and decision-making.
- "Structures and practices" (p. 47), emphasizing the need for restructuring that eliminates barriers (in terms of student placement, as well as teacher roles and responsibilities) and changes in pedagogical practices so that they become more diverse.
- "The policy context" (p. 48), stating that policies outside of those developed by the school can both support and detract from a school's inclusive practices.

It is important to note that Dyson et al. (2002) also reported that most of the studies identified were case studies, and these case studies tended to focus on schools that were pre-determined to be inclusive. Data collection methods tended to be similar across the studies, and largely featured interviews with stakeholders and unstructured observations. Only a few studies also included perspectives from students and/or student test data. Those studies considered to be stronger were those that included perspectives from the students and/or student test data, sought to triangulate perspectives of teachers against other forms of data, and where differences between espoused theories of action and the actual theories in use were explored. They, therefore, make the recommendation that future studies should exhibit the following characteristics:

- Studies that provide "robust" evidence with regards to the extent of inclusion throughout the organization;
- The inclusion of multiple perspectives (including dissident voices) as well as some form of outcomes data;
- The investigation between specific actions and participation by a diverse range of students, "tracing causal links" (p. 57) and testing whether specific school actions were linked to participation by a diverse range of students;
- Search for "discomfirmatory evidence" (p. 57); and
- Use of multiple theoretical frameworks.

The authors acknowledge, however, that such a study would require substantial monetary and other resources and may not always be possible. Therefore, they state that these are simply recommendations, and studies should strive to meet as many criteria as possible.

Ainscow and Sandill (2010) provide a more recent review of the literature, although this review does not attempt to be systematic. Instead, it draws from existing literature and theory to explicate a new framework for describing organizational conditions that promote a change toward inclusion. This framework eschews traditional change strategies that focus on specific pedagogical practices or organizational structures. Instead, the authors state, the literature suggests the need for a framework that emphasizes a view of change as an on-going process that is focused on promoting a culture of inclusion (shared at all levels, including leaders) through connections to other schools and networks, a commitment to learning through inquiry, and distributed leadership.

More systematic but not as applicable or recent as Ainscow et al. (2010), Riehl (2000) features a literature review of studies examining the role of principals in fostering a change toward inclusion. In this review, which "integrates a variety of normative, descriptive and critical perspectives" (p. 58), the term inclusion largely relates to differences related to race, ethnicity, and social economic status, but also refers to the inclusion of students with disabilities. Similar to the claims of Ainscow and Sandill (2010) as well as Dyson et al., (2002), Riehl's review emphasizes the role of culture, values, and beliefs in supporting and sustaining a change toward inclusion. Unlike the other reviews, however, Riehl further asserts that these values must extend beyond the school and across a diverse range of stakeholders including the students, parents, and other members of the community, and that principals can play a critical role in advocating for and generating such shared beliefs. This can be accomplished by promoting the adoption of more inclusive practices and a more inclusive culture within the school, and by also fostering connections between the school and the larger community.

While each literature review has limitations with regards to the topic of consideration and/or its methods of investigations, collectively, the three reviews provide a strong starting framework for the organizational conditions that promote a change toward inclusion. As shown in Table 2, these reviews share a number of common assumptions about what is needed to foster organizational change toward inclusion, including cultures, values, and beliefs that emphasize disability and diversity as a dimension of human difference and not a deficit; collaboration within and across

institutions; and the importance of both formal and distributed leadership. Each review, however, also provides unique insights on the conditions that promote inclusion. While Riehl (2000) highlights the importance of community involvement, Ainscow and Sandill (2010) emphasize change as an on-going process that is informed through inquiry and review of evidence of learning.

The compilation of the conditions that promote a change toward inclusion as identified across the three literature reviews was utilized as a beginning categorization scheme for examining the conditions that facilitate or present barriers to a change toward inclusion across the 25 empirical studies located as a part of this review. This scheme was then expanded upon through the emergence of additional themes identified in the review of the empirical studies.

Table 2 provides a summary of the occurrence of the identified themes across the three literature reviews and the 25 empirical studies.[1] As evidenced by the data presented in this table, the following were mentioned as barriers or facilitators of a change toward inclusion:

- Shared inclusive cultures, values, and beliefs;
- Internal knowledge, expertise, and resources;
- Leadership, including both formal leaders and distributed;
- Policies, both internal and external;
- Collaboration amongst professionals within and across institutions;

[1] It should be noted that there is overlap between the empirical studies and the literature reviews, as some of the studies reviewed here were also included in some of the literature reviews.

- Involvement of people with disabilities, their families, or communities;
- Pedagogical and other organizational practices;
- Change viewed as an on-going process;
- Learning through reflection and evidence;
- Outside experts;
- Funding;
- Organization history;
- Conflict; and
- Individual passion.

Shared inclusive cultures, values, and beliefs. Shared cultures, values, and beliefs was the most frequently stated condition that facilitated or provided a barrier to change. This condition was cited across 20 of the 25 empirical studies reviewed, as well as all three literature reviews. These studies and reviews explicitly state the need for a change toward inclusion to challenge existing values and beliefs concerning disability and inclusion and to foster and support the development of more inclusive cultures within organizations. This focus on inclusive cultures extended across the range of study types, as well as institutional types.

Multiple studies discussed the barrier to change that stemmed from persistent medical notions of disability and previously held conceptions of people with disabilities as somehow "other." Some studies found that such values and beliefs played a critical role in sustaining the segregation of individuals with disabilities from their non-disabled peers, an occurrence that was particularly prevalent in schools (Hakala, 2010; Parrilla,

1999). Others found that while physical barriers that promote segregation may not be present or were eliminated through leadership decisions and externally-driven policies, the absence of an inclusive culture within the organization led to continued practices of differentiation, (Dodd, 2010; England, 2003; Mamlin, 1999; Sandell, 2003; Singal, 2008) and a disconnect between the extent of inclusive practices as understood by organizational staff members and observed by the researchers (Bonner, 2004; Imants, 2002; Mamlin, 1999; Nind, Benjamin, Sheehy, Collins, & Hall, 2004; Powell & Hyle, 1997; Rodgers, 2005).

Conversely, multiple studies also found that the presence of an inclusive culture, where organizational stakeholders shared a belief that all learners are different and require differing environments to succeed, corresponded to more inclusive practices. This was seen in studies that looked at non-profit organizations (Hamner, Hall, Timmons, Boeltzig, & Fesko, 2008) and those that looked at schools (Ainscow, Booth, & Dyson, 2004; Downing, Spencer, & Cavallaro, 2004; Fisher, Sax, & Grove, 2000; Frankel & McKay, 1997; Kozleski & Smith, 2009; Kugelmass, 2001). Inclusive cultures were not reported as a facilitator of change in any of the three museum-focused studies, although existing organizational cultures and norms were specifically called out as barriers to inclusion in two of the studies (Dodd, 2010; Sandell, 2003).

The repeated mention of organizational cultures, values, and beliefs as a facilitator/barrier to change suggests that this condition is a key factor in any organizational change toward inclusion. This finding, however, should be viewed with some trepidation. Given that the social model of disability is based on a philosophy that

exclusionary practices are rooted in the perspectives, values, and beliefs held about disability in the larger society, it is not surprising that 20 of the 25 empirical studies reviewed as well as all three literature reviews explicitly state the need to change existing values and beliefs concerning disability and inclusion, and the need to foster and support the development of more inclusive cultures within organizations. In some ways, this finding could be a self-fulfilling prophecy; if one's framework starts with an assumption that exclusion is the result of cultural values that promote a deficit-view of disability, then it is likely that one will end with a conclusion that cultural values plays a critical role in a change toward inclusion. In some cases, the researchers equated the lack of an inclusive culture with lack of change.

It is important to note that only one of the reviewed studies looked for disconfirming evidence (such as the kind advocated for by Dyson et al., 2002) that challenges such a viewpoint. Ainscow and Kaplan (2005) found that, when a school was viewed from the eyes of its students, evidence of non-inclusive cultures could be found to operate alongside inclusive educational practices. Future research about change toward inclusion, therefore, should look not only to record evidence of cultural shifts, but should also seek to examine whether it is possible for individuals to engage in inclusive practices without shifting one's values and beliefs toward disability, and how such practices are experienced by people with disabilities.

Internal knowledge, expertise, and resources. Although not specifically cited as a barrier/facilitator for change in the three literature reviews, the presence or lack of internal knowledge, expertise, and resources was cited as a facilitator/barrier for change

across 12 of the 25 studies. This is the most frequently cited condition that emerged from the review of the empirical studies that was not present in the three literature reviews.

Although frequently cited, the benefits of such internal resources were not always viewed as a positive force for change. Some studies found that formal leaders tended to defer responsibility for change to in-house experts who did not have the authority to facilitate the change, which prevented the change from taking place (Powell & Hyle, 1997). Comparatively, other studies suggested that internal expertise and knowledge of inclusive practices was a necessity as such expertise played a critical, supportive role in fostering knowledge and understanding of inclusive practices across a wider range of professionals (Downing et al., 2004; Fisher et al., 2000; Frankel & McKay, 1997; Hakala, 2010; Hein, 2002; Simon, Echeita, Sandoval, & Lopez, 2010; Sindelar, Shearer, Yendol-Hoppey, & Liebert, 2006). Other studies found that the absence of internal expertise and knowledge served as a significant barrier for sustaining meaningful change (Dodd, 2010; Mamlin, 1999; Sindelar et al., 2006; Singal, 2008).

The different perspectives offered around the role of internal expertise may reflect varying viewpoints concerning organizational knowledge and the process through which it is constructed. Some studies seemed to reflect traditional notions of knowledge as something that can be disseminated or transferred from one individual to another, while other studies viewed knowledge as something that is co-created within an organization.

Leadership. Of the 25 studies reviewed, 10 explored the role leadership plays in facilitating or detracting from a change toward inclusion. The definitions used to define leadership varied from study to study. Some focused on formal leaders (Ainscow et al.,

2004; Bonner, 2004; Kozleski & Smith, 2009; Mamlin, 1999; Powell & Hyle, 1997; Sindelar et al., 2006; Singal, 2008), while others examined informal leaders and notions of distributed leadership (Fisher et al., 2000; Frankel & McKay, 1997; Hamner et al., 2008; Kugelmass, 2001; Vernon-Dotson, 2008).

Studies examining formal leaders highlighted the need for such leaders to be not only supportive of the need for a change toward inclusion, but also to have knowledge of and belief in more inclusive practices. Riehl's (2000) literature review highlighted the role formal leaders can play in the development of more inclusive practices. Such a role was confirmed in Ainscow et al. (2004), where the schools that adopted more inclusive practices were more likely to have formal leaders who exhibited an openness for reflection and inquiry, and Singal (2008), where school leaders were determined to be the initiator and main driving force behind the change toward inclusion. Further studies of formal leaders demonstrated that leaders who do not have knowledge of inclusive practices or exhibit cultures, values, or beliefs that are consistent with inclusion can serve as a barrier for change (Ainscow et al., 2004; Bonner, 2004; Kozleski & Smith, 2009; Mamlin, 1999; Powell & Hyle, 1997; Sindelar et al., 2006; Singal, 2008).

While the absence of knowledgeable formal leaders who were committed to inclusion was frequently cited as a barrier to change, the presence of distributed leadership was considered to be a facilitator of change. Each study that examined leadership from a distributed perspective noted that the presence of a distributed leadership team (whether formally designated or informal in nature) corresponded with a change toward inclusion (Fisher et al., 2000; Frankel & McKay, 1997; Hamner et al.,

2008; Kugelmass, 2001; Vernon-Dotson, 2008). One study cautioned, however, that distributed, informal leadership teams may not be successful if their efforts are not conducted with the support of and in collaboration with formal leaders (Vernon-Dotson, 2008). These findings suggest that a change toward inclusion may be more likely in a setting that fosters distributed leadership that is connected to and fostered by formal organizational leaders.

Collaboration. Across the reviewed studies, nine cited collaboration as a critical element in organizational change toward inclusion. In schools, studies highlighted multiple dimensions of collaboration. Collaborations amongst teachers (especially special education and general education teachers) was mentioned (Bonner, 2004; Parrilla, 1999), as was collaboration between the formal school leaders and teachers (Powell & Hyle, 1997). Most of the studies, however, suggested that what was needed was strong collaboration across a broad range of stakeholders: parents, teachers, school leaders, and even other schools (Ainscow et al., 2004; Downing et al., 2004; Frankel & McKay, 1997; Kugelmass, 2001). This point was strongly emphasized in Riehl's (2000) review of the role of leadership in the change toward inclusion in schools.

Studies conducted outside of school environments also highlighted the need for collaboration. Dodd's (2010) and Hein's (2002) studies, both of which focused on museums, each found that involvement in a network of organizations can be a facilitator of change, especially when multiple organizations within the network value inclusion and share practices with one another. Furthermore, Hamner et al. (2008) emphasizes that collaboration within and across non-profit organizations also served as a facilitator of

change. The occurrence of this theme across organization types highlights the need for multiple and a diversity of individuals to work together in a coordinated fashion to facilitate organizational change toward inclusion.

Involvement of people with disabilities. "Nothing about us without us" has been the fervent cry of the disability rights movement since the 1970's (Charlton, 1998). It is not surprising, therefore, that studies conducted within the framework of the social model of disability would highlight the importance of involving people with disabilities in the change toward inclusion. In line with Riehl's (2000) assertion of the need for school leaders to involve the broader community in the effort of change toward inclusion, findings from seven of the reviewed empirical studies also suggest that the involvement of people with disabilities and other community stakeholders (such as parents of children with disabilities) can play a critical role in supporting a change toward inclusion. Some state that the involvement of the community is essential for sustaining such a change toward the inclusion of people with disabilities (Downing et al., 2004; Hakala, 2010; Simon et al., 2010). Other studies cite the critical role people with disabilities and other stakeholders can play in advocating for the change to take place (Singal, 2008). Still other studies explore the role that working with people with disabilities can play in challenging traditional assumptions of disability and prompting practitioners to question their practices (Fisher et al., 2000; Hein, 2002; Parrilla, 1999). The notion that working with people with disabilities can play a critical role in changing individual (as opposed to organizational) conceptions of disability has been confirmed in other studies conducted

across a range of fields (Yuker, Block, & Younng, 1966), including schools (Bishop & Jones, 2003; Kirch, 2005).

Pedagogical and other organizational practices. Multiple studies highlight the need to focus on changing a broad range of organizational practices in order to fully create inclusive organizations and not just organizational policies or knowledge. The six studies that emphasized practices extended across organization types (museums, schools, and corporations). England (2003) describes how a focus on formal policies amongst Canadian banks rather than formalized and informal practices can lead to continued exclusion of people with disabilities from the workforce, as well as feelings from professionals that it is difficult to create a more inclusive organization. Imants (2002) describes a similar finding, stressing how a focus on the formal policy of placement as opposed to developing more inclusive pedagogical practices sustains a system where children with disabilities continue to be underserved in schools in the Netherlands. Sandell (2002) also calls out exclusionary practices as a strong force against greater inclusion in museums, and Hein (2002) identifies the introduction of museum professionals to new accessible practices as a facilitator of change. Ainscow et al. (2004) and Frankel and McKay (1997) also provide evidence that it is possible to support a change toward inclusion by developing greater understanding and knowledge of inclusive practices amongst a group of individuals within an organization.

Change as an on-going process. Six of the reviewed studies specifically reflect a viewpoint of change as an on-going process. While this perspective is not surprising in an action research study (which by definition is an on-going process) (Frankel & McKay,

1997), it is also mentioned in studies that span a range of research methods. Mamlin (1999), in her description of a failed-attempt for change through a long-term partnership between a school and a university, cited the school leaders' view of change as a one-time event as a significant barrier. A similar finding is cited in Sindelar et al. (2006) and Bonner (2004), which also featured university-school partnerships. Evidence of the need for change to be viewed as a process is also provided in the responses of Parrilla's (1999) quantitative survey that looked at inclusive practices in schools in Spain, as well as Hein's (2002) study that looked at sustainment of professional practices in museums. There is evidence, therefore, that change toward inclusion is an on-going process and that practices that promote the idea of change as a one-time or short-term event may work against the sustainment of a change toward inclusion over time in museums.

Funding. Although not specifically called out as a facilitator/barrier to change in any of the three literature reviews, funding to support a change toward inclusion was cited as a facilitator of change across six of the empirical studies that were reviewed as a part of this investigation. This may be explained by the fact that four of the six studies where this was cited were conducted in museums and other non-profit organizations (Dodd, 2010; Hamner et al., 2008; Hein, 2002; Sandell, 2003), while the literature reviews focused on change in schools. Although funding was not described as a major facilitator of change toward inclusion in most studies, the mention of funding as a facilitator in studies that examined a range of institution types does suggest that funding should be examined as a potential contributor toward change in museums. The perception of professionals that lack of or access to funding was a consideration could also be an

indicator of a lack of deep change toward inclusion. Studies examining perceptions of inclusion have found that funding is a frequently cited counter-frame to notions of disability and inclusion, and reflects a belief that accessibility is an additional cost beyond what is needed for the general population (Jeon & Haider-Markel, 2001).

Learning through reflection and evidence. In their literature review, Ainscow and Sandill (2010) articulate a framework for change toward inclusion that emphasizes professional learning and cultural changes that stem from on-going inquiry and reflection. Four of the reviewed studies feature the use of an action research design to both explore and facilitate institutional change toward inclusion. While two of these studies reported that outside facilitation was essential for promoting a change toward inclusion and the use of evidence to support professional learning (Frankel & McKay, 1997; O'Toole, 2007), another found that such a practice offered mixed results (Ainscow et al., 2004; O'Toole, 2007), and the remaining fourth study found that teachers were not always willing to listen to action research and evidence to support change (Ainscow & Kaplan, 2005). Furthermore, Nind, Benjamin, Sheehy, Collins, & Hall (2004) report that their early attempts to implement a more participatory research study failed due to the time constraints of school professionals, which led them to abandon this strategy at the on-set of this study.

The evidence suggests that a practice of learning from inquiry will not always lead to a change toward inclusion. However, this does not mean that evidence-based professional learning could not be viewed as part of a larger framework for facilitating change. Ainscow (2007), in his discussion of learning through inquiry as a facilitator of

change, annunciated the conditions that need to be present to support such an effort, such as distributed and supportive leadership, connections to other organizations and networks that foster inclusive practices, and explicit teacher training around pedagogical practices and curricula that are inclusive of students with disabilities.

Outside experts. Outside experts who provide institutions with professional expertise and knowledge were mentioned across three studies. Findings from these studies were mixed, and do not suggest that such a condition is sufficient for promoting a change toward inclusion. Mamlin (1999) reported on a university-led intervention program that failed to promote a change toward inclusion within a targeted school. The university facilitators met great resistance from school leaders and other staff members, which eventually led to an early end to the inclusion program. Sindelar (2006) found that a university-facilitated professional development program led to early successes at one school, but these successes toward inclusive practices were not sustained. Hein (2002) also found that professional development provided by the Association of Science-Technology Centers (a professional organization for science museum professionals) did result in short-term changes amongst the participating professionals and institutions, but these changes were sustained in only a few of the organizations.

Conflict. The impact of within-institution conflicts was mentioned across four of the reviewed studies. Ainscow and Kaplan (2005) discussed the role internal conflict played in teacher's willingness to listen to and accept evidence generated through a student action research project that investigated the school's practice of inclusion. In this case, the conflict was not related to inclusion, but led to internal stress that affected the

implementation of the action research project that was intended to serve as an intervention for change. In contrast, both Bonner (2004) and Frankel (1997) reported that internal conflicts regarding teaching practices and the theoretical underpinnings of inclusion served as a barrier that prevented the change toward inclusion from moving forward. To a lesser extent, Hein (2002) also mentioned tension as a factor, although he specifically stated that the environment in the museums that were the focus of his study never became contentious. There is a potential that conflict and other internal stresses can serve as a barrier to change toward inclusion, but the evidence at this point is still limited.

Organization history. Organization history was not widely studied or mentioned as a facilitator or barrier to change toward inclusion. In most cases, the reviewed studies did not feature data collection methods or theoretical underpinnings that would have enabled the influence of the organization's history to be explored. The two studies that featured historical analysis, however, did find that the history of the organization played a role in its current practices of inclusion. In a school whose early history was shaped and formed by an inclusive practices paradigm, the organization's history was found to contribute to the sustainment of inclusive practices over time (Kugelmass, 2001). Conversely, in schools and organizations that were founded under medical paradigms and had historically focused on curing children with disabilities, the history of the organization detracted from a change toward inclusion (Hakala, 2010).

The impact of organizational history is also articulated in the study of botanical gardens conducted by Dodd (2010), which posited that the historic origins of the gardens as collections-based rather than public-based institutions may currently be serving as a

barrier to change toward inclusion within the United Kingdom's botanical gardens. The notion that organization history plays a critical role in current practices is based on ideas of organizations as representations of larger societal institutions (Scott, 2008). Studies of change in museums conducted through the lens of institutional theory further support the idea that organizational history can impact current organizational practices (Ogawa et al., 2008), as have studies that examined change from the perspective of organizational learning (Huber, 1991; Levitt & March, 1988; March & Olsen, 1975). Given that organizational history has been demonstrated to impact change toward inclusive practices in studies that featured historical analyses and that additional, museum-specific studies and organizational learning research have also identified organizational history as an important component for change, the absence of history as a facilitator/barrier to change in a greater number of studies may more strongly reflect the methods of investigation than the actual impact of such a condition on change.

Individual passion. The passions of individual staff members was only mentioned in the study conducted by Dodd (2010) as a facilitator of change. In this study, which largely relied on interviews with museum professionals, individual passion was listed as one of multiple catalysts that can promote a change toward inclusion. The author cautions in the study, however, that individual passion is not sufficient for promoting change. Furthermore, Riehl (2000) emphasizes that the passions of even the formally designated school leaders are not sufficient for supporting a change toward inclusion. Given that this condition was only cited in one study and the connection between the condition and the change for inclusion was weak, individual passion should not be

considered at this point to be a strong contributor to the change toward inclusion within science museums.

Conclusion

Findings from this literature review suggest that there are a number of common, core conditions that have been found to promote a change toward inclusion across a range of organization types. While the list of conditions may appear to be long, they do coalesce into a few common and shared groupings related to the *process* of change, the *context* of change, and the *kind* of change that leads to the development of an organization that is inclusive of people with disabilities. Understandings of change through the perspective of organizational learning further elucidates the connections between these three grouping.

The 25 empirical studies reviewed suggest that the change *process* should be one that is on-going, almost always facilitated by a group of diverse individuals who work in collaboration with one another, supported by formal leaders, sometimes reflective, and at times involves external individuals and other organizations. It appears rare that any one individual can facilitate change on his or her own, and change is almost never sustained from one-time events. This view of the process of change coincides with the notion of organizational learning and change as an on-going process that requires opportunities for feedback and experimentation, input gathered from sources outside the organization, and is sustained through diverse viewpoints that are spread across the organization (Huber, 1991).

The studies reviewed also present an image of the organizational *context* that can support a change with external policies, organizational history, funding, and the internal/external organizational climate (including presence/absence of conflict) all playing a role. Here again, connections appear to Huber's (1991) review where he identifies the origins of the organization as playing an important role in "congenital" learning, as well as the presence of solutions in other organizations. Findings from these reviewed studies also connect to notions of double loop learning, which requires organizations to respond to and learn from feedback. The ability of professionals to do so is severely diminished in environments that exhibit characteristics of conflict, tension, and lack of trust (Argyris & Schon, 1995).

Finally, this review further highlights that the *kind* of change that will be sustained over time is one that is deep and features changes in a broad range of organizational practices and its deeply held cultures, values, and beliefs. Such beliefs are shared amongst the organization's professionals, stakeholders, and broader community. Multiple studies offered evidence of small, iterative changes. Conversely, changes to goals, values, beliefs, and multiple practices were rarely reported. Again, these themes connect to those advocated by Huber (1991), particularly his assertion that sustained organizational learning stems from learning that takes place across multiple areas of the organizations and the development of shared conceptions within the organization, and by Argyris and Schon (1995), in their call for double loop learning through the testing of one's assumptions. This review of literature related to inclusion further specifies that those shared conceptions need to extend beyond the boundaries of the institution and

across a broad range of organizational stakeholders who may exist external to the organization.

It is by using the lens of organizational learning to view the findings from research related to change toward inclusion that an image of change toward inclusion in science museums begins to emerge. Based on this review, it can be hypothesized that the process of change toward inclusion in science museums is on-going and not resulting from any one event or professional development experience. Instead, the museum learns about inclusion by continuously testing ideas with an audience that includes people with disabilities and by using common practices of prototype testing and community advisor reviews. The process involves not just one person or leader, but instead features a group of individuals who work across institutional boundaries, whether those boundaries be intra (departmental or project based) or inter-museum.

The science museum context needs to be one that supports such a process. External policies, such as those fostered by major federal granting agencies and local/state/federal policies, should not conflict with the change, and perhaps, even support it. The internal context also includes formal leaders who are not in opposition to the proposed change and is absent of internal conflicts or other stressors that prevent staff members from feeling safe to experiment and explore new ideas. The external context also includes knowledge and ideas outside of the museum from which the organization could learn.

Finally, the kind of change that takes place is deep. The changes extend beyond policy statements and structures such as the presence of an accessibility coordinator or

committee and include fundamental changes in how the organization thinks about its audience and practices informal science education. Changes go beyond small iterative changes related to exhibition design and the availability of accessible programs (such as presence of large-print hand-outs and periodic American Sign Language tours), and present evidence of double loop learning and deeper changes to the organization's notion of disability, such as exhibitions that feature elements of universal design and multimodal, multisensory learning experiences from which all visitors could learn (Reich et al., 2010). The change is also widespread, and present in the understandings held across a range of organizational departments (including exhibitions, education, visitor services, amongst others) and within the ideas and values of core stakeholders who are external to the museum. It is from this framework that the investigation of the conditions that facilitate or pose barriers to change toward inclusive practices in science museums began.

Table 1

Summary of Empirical Studies that Examine Organizational Change toward Inclusion

Author	**Year**	**Institution**	**Methods**	**Facilitators and Barriers**
Dodd	2010	Museum	Case study: Observations and interviews with museum professionals	*Facilitators:* Interest in public's connection to plants; broader societal interest in inclusion; accountability; involvement in botanical garden networks; and individuals' passions. *Barriers:* Traditions as academic rather than public institutions; lack of inclusion-related capacity; lack of knowledge of visitors; homogeneous workforce; separation from public governing bodies; and lack of connection to the broader policy context. *Extent of inclusion:* Both exclusionary and inclusive practices exist within botanical gardens; some gardens embrace inclusion more than others.

Hakala	2010	School	Case study: Historical analysis, document reviews, and interviews with teachers and administrators	*Facilitators:* Knowledge of inclusive practices; and community support. *Barriers:* A "medical" discourse when describing students with disabilities; and organizational origins as medical institutions. *Extent of inclusion:* Segregation is still dominant in the discourse surrounding students with disabilities.
Simon	2010	School	Survey research: Survey of people with disabilities	*Facilitators:* None specified. *Barriers:* Lack of educational innovation, teacher training, parental participation, technology, and funding. *Extent of inclusion:* Not specified.

Kozleski	2009	School	Case study: Field notes, focus groups, interviews, observations, and demographic data	*Facilitators:* Belief that all students are learners and different conditions facilitate each individual's learning. *Barriers:* Focus on what was changed rather than how; lack of connection between change leaders and those who enact the change; and focus on changing practices rather than values. *Extent of inclusion:* Some schools and districts exhibited inclusive practices, while others did not. Those that did exhibit inclusive practices tended to exhibit values in support of inclusion.

Hamner, Hall, Timmons, Boeltzig and Fesko	2008	Non-Profit	Case study: Interviews with staff members	*Facilitators:* Informal leaders who work collaboratively with others internal and external to the organization; existence of a common goal; and funding. *Barriers:* Lack of internal support. *Extent of inclusion:* Examples of inclusive practices are provided.

Singal	2008	School	Case study: Interviews with school professionals and classroom observations	*Facilitators:* Parent involvement; committed school leader; financial incentive; and philanthropic beliefs. *Barriers:* Teachers were excluded from decision-making; failed communication; lack of teacher training around inclusive practices; and teachers' values and beliefs reflected notions of students with disabilities as "other." *Extent of inclusion:* Evidence of exclusionary practices alongside inclusive practices existed within a school known for its inclusive practices. Most teachers provided separate instruction for students with disabilities within the context of the general classroom.

Vernon-Dotson	2008	School	Case study: Observations, documents, and interviews/ focus groups with staff members	*Facilitators:* Teacher leadership teams; committed principals and other formal leaders; trust amongst professionals; time; committed stakeholders; and on-going professional development. *Barriers:* Lack of communication between the formal leaders, the teacher leadership team and school teachers; and principal turnover. *Extent of inclusion:* There were multiple indicators of a change toward inclusion, including an increase in the number of students with disabilities who were present in the general education classrooms and in the schools. The extent of change varied across the studied schools.

O'Toole	2007	School	Case study/ Action research: Action research, with active involvement of adults learners with disabilities	*Facilitators:* Action research where teachers worked closely with learners who have disabilities. *Barriers:* None specified. *Extent of inclusion:* Inclusive practices were described.

Ainscow, Booth and Dyson	2006	School	Case study/ Action research: Collaborative action research project, featuring videos of classroom activities and interviews with students	*Facilitators:* Measures of progress against stated goals, coupled with data that called into question existing practices; and school leaders open to questioning practice. *Barriers:* Teacher perceptions that there was one certain way things should be done; and NOT other non-inclusion policies, which influenced the way change toward inclusion was enacted, but did not detract from change. *Extent of inclusion:* Some schools demonstrated more evidence of inclusive practices than others.

Sindelar	2006	School	Case study: Observations and interviews with professionals	*Facilitators:* University-led professional development. *Barriers:* Multiple leadership changes in a short period of time; frequent teacher turnover; lack of sustained teacher professional development related to inclusion; and changing district and state policies that were at odds with the employed inclusive practices. *Extent of inclusion:* This school had originally adopted inclusive practices as the result of a university-led professional development program. Over time, these practices were not sustained.

Ainscow and Kaplan	2005	School	Case study/ Action research: Student-captured photographs and student interviews	*Facilitators:* None specified. *Barriers:* Persistence of deficit model of students amongst teachers; lack of openness to disconfirming data; and work environment stress. *Extent of inclusion:* Inclusive practices did exist and had been documented, but student data suggested that teachers still operated under the deficit model in their daily interactions with students.

Rodgers	2005	Museum	Case study: Textual analysis, observations, and interviews with museum staff and people with disabilities connected to the museum	*Facilitators:* None specified. *Barriers:* Factors outside of the control of the museum, such as local transportation; definition of inclusion that did not overtly acknowledge disability; policies that did not correspond to practices; and limited engagement of people with disabilities with the museum. *Extent of inclusion*: Not specified.

Bonner	2004	School	Case study: Interviews with teachers	*Facilitators:* Social and emotional support amongst colleagues; and collaboration. *Barriers:* Teacher's commitment to the change lacked sufficient depth; lack of shared purpose amongst the teachers; lack of continued emphasis on the change process; changes in school leadership; and conflict between the various school players involved with the change. *Extent of inclusion:* Although the school leaders had assumed that the change toward inclusion had been sustained over time, interviews with teachers revealed that this was not the case.

Downing	2004	School	Case study: Interviews with teachers, parents, students, and administrators	*Facilitators:* Parent involvement; belief in inclusive practices; knowledgeable faculty and staff members; and collaboration. *Barriers:* Staff turnover; and lack of understanding of the needs of students with disabilities. *Extent of inclusion:* Examples of inclusive practices are provided.
Nind et al	2004	School	Case study: Observations, audio/video recordings, and interviews with teachers, students and administrators	*Facilitators:* NOT emancipatory research. *Barriers:* Teachers' perceptions that the disability was a function of the characteristics of the child. *Extent of inclusion:* In addition to the presence of some inclusive practices, there was also extensive evidence of exclusionary practices and notions that ability/disability was a characteristic of the child.

England	2003	For-profit	Case study: Quantitative analysis of existing employment data, textual analysis, and interviews with bank professionals	*Facilitators:* NOT legislation. *Barriers:* Prevalence of medical notions of disability and ableism; and informal practices not covered by existing legislation. *Extent of inclusion:* Very little progress had been made between 1987 and 2001 in terms of the percent of people with disabilities who are working for Canadian banks.

Sandell	2003	Museum	Qualitative: Interviews with museum professionals	*Facilitators:* Government policies promoting inclusion; individuals in the field who are committed to inclusion; funding for inclusive practices; and research-based knowledge of inclusive practices. *Barriers:* Existing attitudes about inclusion; existing practices; negative perception of museums by members of the public; homogeneous workforce; and conflicting systems and structures. *Extent of inclusion:* Not specified.

Hein	2002	Museum	Qualitative: Interviews with museum professionals, observations, and document review	*Facilitators:* New connections with other museum professionals interested in accessibility; interacting with people with disabilities through workshops; access to information resources; focus on universal design; models of commitment to inclusion; and internal team effort. *Barriers:* Time/resources; and tension between individuals. *Extent of inclusion*: Concrete changes related to accessibility were made at the six lead institutions. In addition, participating staff members and their institutions were more aware of issues related to disability, had formed local disability connections, and demonstrated increased comfort working with people with disabilities.

Imants	2002	School	Quantitative: National data related to referrals to special education, and surveys of schools	*Facilitators:* NOT current education policies. *Barriers:* Bureaucratic desire for standardization; history of separate teachers for students with disabilities; and focus on student placement rather than processes, cultures and practices that promote inclusion. *Extent of inclusion:* There was a separate education track for students with disabilities as inclusive educational practices were not enacted.

Kugelmass	2001	School	Case study: Historical analysis, observations and interviews with teachers and administrators	*Facilitators:* Multiple individuals, including the school principal, who share a vision, beliefs and commitment to inclusion; collaboration between teachers and parents; and the school's founding within a framework of inclusive practices. *Barriers:* The enactment of policies external to the school that are contrary to the inclusive practices. *Extent of inclusion:* Inclusive practices within this school persisted over time, even with a change in leadership. The learner-centered curriculum, however, diminished over time due in large part to shifting policies within the district.

Fisher	2000	School	Case study: Observations and interviews with school personnel	*Facilitators:* Teacher involvement in defining the vision and planning for the change; on-going professional development; the presence of knowledgeable teachers (including special education and paraprofessionals) who could guide and support other teachers; a culture that promoted an ideology of inclusion; and presence of students with disabilities in all classrooms. *Barriers:* None specified. *Extent of inclusion:* Inclusive practices persisted in the school, even during turbulent times such as a change in leadership, teacher turnover, budget cuts, and a teacher strike.

Mamlin	1999	School	Case study: Participant observations	*Facilitators:* NOT the involvement of university researchers. *Barriers:* Lack of shared values, understandings, motivations and capabilities amongst the school personnel related to inclusion; poor communication; notions of change as a one-time event; and leaders who do not support the change or were not knowledgeable about inclusion. *Extent of inclusion:* Although the school referred to their practices working with students with disabilities as "inclusive," the researcher found that students with disabilities and the special education teachers were still very segregated.

Parrilla	1999	School	Case study/ Survey research: Started with quantitative survey of the field, then looked at specific cases	*Facilitators:* Diverse group of students in the classroom; voluntary enactment of inclusive practices; collaboration between teachers; and viewing inclusion as a process rather than a one-time event. *Barriers:* Larger numbers of staff and students; and enactment of inclusive practices that is enforced by law. *Extent of inclusion:* Partial integration is more likely than full integration in the schools studied. The schools' trajectories toward inclusion were not linear, and included steps back as well as forward. Exclusionary practices exist alongside inclusionary practices.

Frankel and McKay	1997	University day care	Case study/ Action research: Participatory action research, including involvement of parents and teachers in the research, focus groups, and observations	*Facilitators:* On-going reflection; collaboration amongst all stakeholders; shared leadership; a way to negotiate arising conflicts; change in attitudes; and clear and meaningful policies and procedures that were developed collaboratively over time. *Barriers:* Lack of understanding of inclusive practices amongst educators. *Extent of inclusion:* Inclusive practices developed over time. At times, practices did not meet the needs of all students.

Powell and Hyle	1997	School	Case study: Observations, and interviews with school professionals, parents and students	*Facilitators:* Internal special education experts who provided a vision, facilitated professional development, and served as a support/resource. *Barriers:* Lack of knowledge and attitudes for inclusion amongst school leaders; and lack of understanding of reasons for the change amongst the teachers. *Extent of inclusion:* There was evidence of both inclusive and exclusive practices. Principals thought their schools were inclusive, when in fact their notion of inclusion was not in accordance with the law.

Table 2

Summary of Core Themes Identified in the Literature Reviews and Empirical Studies

Barriers/ Facilitators	Dyson, 2002	Ainscow and Sandill, 2010	Riehl, 2000	Ainscow, 2007	Emergent themes	Total empirical studies
Shared cultures, values, or beliefs	X	X	X	X		20
Internal knowledge, expertise, and resources				X	X	12
Leadership (formal and distributed)	X	X	X	X		11
Policies (internal and external)	X			X		10
Collaboration	X	X	X	X		9
Involvement of people with disabilities			X			7
Pedagogical and other practices	X	X	X			6
Change as an on-going process		X		X		6
Funding					X	6
Learning through reflection and evidence		X		X		5
Conflict					X	4
Outside experts					X	3
Organizational history					X	3
Individual passions					X	1

Chapter 3: Methods

The purpose this research study was to generate an enhanced understanding of the organizational contexts and processes that facilitate, sustain or impede a change toward more inclusive educational practices in science museums. This research study investigated the following questions: *What are the contexts and processes that facilitate, sustain, or impede a science museum's change toward practices that are inclusive of people with disabilities? How do these processes and contexts influence the outcomes of this change?* Sub-questions included the following:

- What are the *processes* that facilitate/impede a change toward inclusion? To what extent is the change on-going versus episodic and periodic? Who is and is not involved in the change process? To what extent, if at all, do the organizations conduct intentional experimentation and test their ideas? To what extent, if at all, do the organizations seek ideas from outside its walls? What, if any, problematic situations do the professionals encounter along the way, and how do they respond? How, if at all, are the actual practices of the organization the same/different from the theory of action of the professionals?
- What are the internal/external *contexts* that facilitate/pose barriers to a change toward inclusion? How, if at all, do government policies or funders influence/detract from a change toward inclusion? In what ways, if any, does knowledge/practices from outside the organization influence its inclusive practices? During the years of change, has the organization experienced any

difficult times, stress, conflict, or financial difficulties? If so, how has this influenced professional's openness and willingness to learn and change?

- What are the *kinds* of changes that do and do not take place? Is there evidence of change in educational practices? Is there evidence of change in knowledge, attitudes, and beliefs about people with disabilities and inclusion? How widespread and shared is the change within the organization? What kinds of changes do not take place? How do people with disabilities experience these changes?

- How, if at all, do the change *processes* and *contexts* appear to influence the *kinds* of change that take place within each organization?

The research orientation was a multiple case study, conducted within a qualitative research paradigm. Such an orientation places an emphasis on holistic and detailed descriptions of a collection of cases. Each case details change toward inclusion in a museum. The collection of cases or the "quintain" (Stake, 2006, pg. 6) describes medium-to-large-sized science museums that have sustained efforts to increase the inclusion of people with disabilities in informal science learning. Rich descriptions were generated for both the individual cases and the quintain, with the intent of enabling the reader to form connections between the context of the cases and other contexts with which they are familiar (Merriam, 1998; Stake, 1995, 2006).

Case Selection

Three science museums were selected to participate in this study. To protect the identity of the participating organizations, the names of the museums are not included in

this report. Instead, they are referred to through names that describe some of the differentiating characteristics of the museums: the Large Science Museum (LSM), the Outdoor and Explore Museum (OEM), and the Urban Community Museum (UCM).

The three study cases are all science museums that meet the definition of an organization that has sustained efforts to include people with disabilities in informal science learning, as detailed in the Center for the Advancement of Informal Science Education (CAISE) report *Inclusion, Disabilities and Informal Science Learning* (Reich et al., 2010). This report states that an organization can be considered to have sustained efforts to include people with disabilities if they have either an established, institution-wide initiative that is aimed at developing an inclusive science museum learning experience, or a record of sustained work in the area of inclusion that has taken place over five years and over multiple projects.

Examining science museums that have already taken actions toward the inclusion of people with disabilities allowed the study to investigate the processes and contexts that support and encourage professionals to take action as well as catalogue the types of actions these museums choose to pursue; neither of these two elements could have been explored at museums that have not taken action. It was assumed at the outset that present within each of these organizations were also areas of inaction, thus also enabling an investigation of the processes and conditions related to inaction. This assumption, that organizations that have achieved some level of success will offer opportunities to study action and inaction, was based on findings from multiple studies that found substantial evidence of exclusion in organizations considered to be inclusion leaders (Ainscow &

Kaplan, 2005; Bonner, 2004; Nind et al., 2004; Parrilla, 1999; Powell & Hyle, 1997; Singal, 2008).

Involving organizations that have demonstrated some commitment to inclusion also helped to garner organizational buy-in to conduct the study. Organizations that felt they had something to hide or that felt that this was not an important topic may not have been willing to participate in this study. The three organizations that agreed to participate in this study communicated that they were willing to participate as they felt that (a) generating knowledge about this topic would be important for the field; and (b) this study could help them to advance their own organizational goals of being more inclusive of people with disabilities.

The three case organizations are all located within the United States. The decision to focus solely on the United States was a practical one, aimed at containing the cost and time needed to complete the study. Limiting the location of the science museums also narrowed the scope and scale of the study to focus more on the two overarching frameworks of organizational learning and the social model of disability. Expanding to organizations outside of the United States would have expanded the scope of the investigation to focus more heavily on policy and culture and its influence on change.

These two selection criteria, organizations that have a proven track record of being inclusive of people with disabilities and organizations in the United States, limit the extent to which the findings from this study can be generalized. It is recognized, therefore, that the findings from this study best reflect science museums in the United States that have already taken actions to be more inclusive of people with disabilities.

While certain case selection criteria limited the extent to which findings could be generalized, other selection criteria sought to expand the applicability of the results. The three case museums were purposefully chosen so that collectively they represented science museums of various sizes (as defined by number of visitors per year, square footage, and annual budget), educational practices (hands-on exhibits, object-based learning, outdoor living collections, interpreted programs, etc.), and geographic locations (Midwestern, Southeastern, and Northeastern United States). These variations provided a way to see how particular changes were tied to particular aspects of the sites that connect to some other science museums, but not all. In addition, any similarities found across these diverse sites may likely be found at other science museums as well. It should be noted what while the size of the organizations did vary greatly, none of the museums reflected science museums that are small in scale. Hence, the findings are best applied to science museums that are considered to be medium or large organizations as defined by the Association of Science-Technology Centers Sourcebook (Association of Science-Technology Centers, 2008)

Data Collection Methods

Multiple data collection methods were used to generate detailed, holistic descriptions of each case, including the following:

- Focused observations and interviews with people with disabilities;
- Interviews with staff members;
- Observations of staff members as they participate in museum work; and
- Collection of documents and artifacts.

The instruments used to guide data collection are included in Appendixes A-C. These data collection methods were specifically chosen as each provides a unique vantage point from which to view the interactions that foster or prevent a change toward inclusion (see Table 3 for a summary of the data collected per site).

Table 3

Data Collected by Site

Data Collection Method	Outdoor and Explore Museum	Large Science Museum	Urban Community Museum
Professional Interviews	18	23	25
Focused observations and interviews with people with disabilities	7 groups (8 individuals)	9 groups (12 individuals)	4 groups (8 individuals)
Museum activity observations	5	7	10
Documents gathered[a]	15	14	18

[a]This does not include photographs, where 60+ were taken at each site.

Data collection took place during three site visits. The first two site visits lasted one-week, and the third took place over two days. The third site visit differed from the first two in that it focused more on sharing preliminary findings as part of the member checks, although some interviews took place during the third site visit before the findings were shared. In addition, some professional interviews took place via conference call if there was an individual who could not be interviewed during the scheduled site visits.

The data were collected by the lead researcher. This researcher was assisted in her data collection efforts by one individual at each participating museum who served as the primary site contact for the lead researcher. This person assisted with data collection by helping to identify the individuals/meetings/events from which the researcher collected data, to arrange times for specific data collection sessions (focused observations and professional interviews), to recruit people with disabilities to participate in the focused observations[2], and to assist with gathering documentation.

Focused observations with people with disabilities. Focused observations were conducted with people with disabilities at each museum to learn more about the museum experience from their perspective. During these focused observations, people with disabilities were observed as they interacted with the museum. Visitors were empowered to direct the location and focus of the observations, specifically pointing the researcher to areas of the museum that they felt were particularly welcoming and those that were unwelcoming to people with disabilities. The observations were buttressed with interviews at the beginning and the end where visitors were asked to reflect upon positive and negative aspects of this and previous museum visits (see Appendix A for the focused observation instrument).

The sensitizing concepts that guided the focused observations and interviews included the following: Areas of the museum where the person with a disability was able

[2] Recruitment of people with disabilities was designated to the site contact so as to enable the organizations to develop connections with people with disabilities in their community. In some cases (almost exclusively at OEM, the site contact also sat in on the disability interviews (but not the staff member interviews). While the benefits of this practice were high for the organizations, the risks to the integrity of the research were perceived to be low. It was presumed (based on the researcher's own experience) that the presence of a staff member would not substantially influence what the participants would report during their interviews as people with disabilities would want to inform the museum of potential areas for improvement.

to function on his/her own without assistance; Areas of the museum where the person with a disability required assistance; Areas of the museum that were inaccessible to the person with a disability, even with assistance; Elements of the museum the person with a disability most appreciated or enjoyed, and those that served as a source of frustration; and "Aha" moments where the person with a disability reported learning something new.

A focused observation/interview protocol was developed using the above listed sensitizing concepts. The interview protocol was designed to follow Patton's (2002, p. 343-344) description of an interview guide, which "provides topics or subject areas within which the interviewer is free to explore, probe, and ask questions that will elucidate and illuminate that particular subject." The provided questions were suggestions, and not a script, and were used to guide the conversation with the interview subjects. If subjects had already addressed certain topic areas that were affiliated with certain questions on the guide, these questions were skipped. If issues arose during the observations that required additional probing, new questions were added to the guide at the start of the interview.

Although it was originally intended that visitors with disabilities would participate in groups of approximately 5 to 8 people, it was difficult to coordinate the schedules of the participating people with disabilities. Instead, some focused observations involved mixed groups while others included only one person. In total, 20 visitors/family groups with disabilities participated in this study across the three case sites (see Table 4).[3]

[3] In some cases, only one individual participated in the focused observations. In other cases, people participated in a group (such as parent and child(ren) or husband and wife). Each group was counted as one participant, as long as this group is one that normally attends the Museum together. Family members were

Table 4

Summary of Focused Observation Participants

Organization	Number of participating individuals/ groups with disabilities	Disability types
Outdoor and Explore Museum	7	Mobility, not wheelchair user (2) Blind/ Low vision (2) Food allergies (1) Wheelchair user (1) Deaf/ Hard-of-hearing (1)
Large Science Museum	9	Mobility, not wheelchair user (1) Blind/ low vision (2) Wheelchair user (3) Deaf/ Hard-of-hearing (1) Intellectual disability (2)
Urban Community Museum	4	Wheelchair user (1) Deaf/Hard-of-hearing (1) Intellectual disability (2)

presumed to have shared knowledge of and experience with the case site, which is why they were counted as one group while those without shared backgrounds were counted separately. For example, if a husband and wife pairing included two people who are wheelchair users, then this group counts as one group. If, however, one person who is a wheelchair user attended the Museum at the same time as another person who is blind and these individuals did not know each other before, this counted as two groups.

The primary purpose of this data source was to learn what people with disabilities described as the kinds of change that have or have not taken place at each case museum. These data were not intended to detail exactly how each museum was or was not inclusive to a broader population of people with disabilities or the educational outcomes of inclusion for people with disabilities. The focused observations were used to obtain insights on each of the museum contexts from the perspective of people with disabilities. These insights informed the questions that were asked of museum professionals during their interviews and also the areas of the museum that were investigated through the professional interviews and observations. In this way, this data collection method served to involve people with disabilities in the research process by utilizing their perspectives to clarify areas for further investigation. The active involvement of people with disabilities in the research process is advocated by those who support the social model of disability (Barnes, 2003) and follows the spirit of the disability rights movement and the rallying cry of "Nothing about us without us" (Charlton, 1998).

The participating people with disabilities were invited to visit the museum and comment on their experience as visitors. When possible, these individuals were selected from the museum's existing membership pool to ensure that they were familiar enough with the museum to offer feedback about the museum's practices. At one of the three case museums, it was not possible to recruit participants through the museum's membership base. At this museum, people with disabilities were recruited for this study through special events that were held at the museum that specifically focused on people with disabilities and through staff members' connections and relationships. In addition, at

the remaining two museums, a few of the visitors were not museum members, but had heard about the study through others who were affiliated with the museum. These individuals had each visited their respective museum in the recent past. Although all of the participating visitors had been to the museums before, only one individual had been involved in the work of their museum. This individual had recently served as a one-time advisor for a specific project. All other participants were visitors, but not insiders to the museums.

Maximum variation sampling was applied to capture the experiences of individuals of a diverse range of disabilities. As the social model of disability purports that it is the environmental and social barriers that define disability, and not the characteristics of the individual, this form of sampling is important for fully understanding the barriers and strengths of the museum context from the perspective of disability given that different disabilities may experience different forms of discrimination and levels of inclusion (S. C. Brown, 2001). Anyone who self-identified as having a disability was allowed to participate in the study. This self-selection process enabled the study to explore differences in how the Museum conceptualized disability as compared to the audience members it serves. This process, however, may have excluded those individuals who do not self-identify has having a disability but whom the museum might consider to be disabled (such as older adults who wear hearing aids).

Due to the level of awareness this study required participants to have of their own disabilities and the environments that meets their needs, all visitors were required to be adults or families that included at least one adult and one person with a disability. In a

few cases, parents of children with disabilities arrived at the museum without their children (even though their children were encouraged to attend), and these individuals participated by describing the most recent experience they had with their children at the museum.

Interviews with staff members. Interviews were conducted with museum staff members to learn more about the museum's inclusive practices from the perspectives of museum professionals, and to learn more about the perceptions these staff members have of the processes and contexts that fostered or impeded organizational learning and change toward inclusion. The sensitizing concepts that guided these interviews included the following: the role the individual plays within the organization; the kinds of change that have and have not taken place at the organization that are connected to the inclusion of people with disabilities; the processes that facilitate or impede change toward inclusion; and the overall context of the organization.

An interview guide was developed for the professional interviews based on the above listed sensitizing concepts. As with the focused observations/interviews with people with disabilities, the guide listed suggested questions and was not considered to be a script. If subjects had already addressed certain topic areas that were affiliated with certain questions on the guide, these questions were skipped. In addition, new questions were occasionally added to the guide for each participant based on information that had been learned through other sources about areas of the organization that were affiliated with that individual. This enabled the researcher to test assumptions or emerging trends in the data by investigating further into certain stories or issues.

Staff members interviewed at each museum included those who work for departments that have a direct impact on the experiences of the visiting public (exhibit design and development, school and public programs, visitor services, outreach, and marketing), and those who hold positions of influence in the organization (such as CEOs and division leaders). Departments where staff members were not interviewed include those that are responsible for accounting, fund-raising, and other administrative functions. In a few instances, administrative staff members were interviewed when they were identified as being strong advocates for or intensely involved with the organization's work related to the inclusion of people with disabilities. Staff members at multiple levels within each organization were also interviewed, including part-time and full-time paid staff members, volunteers, long-term consultants, managers and non-managers.

The number of individuals interviewed at each institution differed. The original aim was to interview roughly 10 individuals per site. Once data collection was underway, however, it was determined that more interviews were needed in order to fully understand the inclusion narrative as it existed across a broad range of organizational areas within each case museum. In total, 66 professionals were interviewed across the three sites (see Table 5 for more information about the number and kind of professionals interviewed at each site).

Table 5

Professional Interview Participants across the Three Sites

Characteristics	OEM	LSM	UCM
Number of professionals	18	23	25
Number of people with disabilities[a]	1	3	3
Number of managers[b]	7	12	13
Organizational areas[c]	Visitor Services, Programs, Exhibits, Human Resources, Facilities, Animal Care, Senior Leadership	Visitor Services, Programs, Exhibits, Human Resources, Facilities, Community Engagement, Research and Evaluation, Marketing, Senior Leadership	Visitor Services, Programs, Exhibits, Facilities, Membership, Senior Leadership
Years of experience	< 2 to 20+ years	<1 to 28+ years	<1 to 22+ years
Employment status	Full-time, volunteer	Full-time, part-time, consultant, volunteer	Full-time, part-time, consultant

Note. OEM is an abbreviation for Outdoor and Explore Museum. LSM is an abbreviation for Large Science Museum. UCM is an abbreviation for Urban Community Museum.

[a]Included in this tally were only those individuals who self-identified as having a disability during their interviews.
[b]Each museum defines who is and is not a manager differently. For the purposes of this study, a person was considered to be a manager if he or she was responsible for supervising full or part-time staff members.
[c]Each museum uses different names to define organizational areas. For the purposes of this study, the organizational areas were defined using terms that are commonly associated with the type of work the individual engages in. The organizational terms were not used as a way to protect the identity of both the individuals within the museums and the organizations themselves.

The researcher worked with the designated contact person at each museum to determine the initial list of professionals to be interviewed. The initial interviewee list was designed to reflect a broad range of organizational areas and a broad range of familiarity with the practices that are inclusive of people with disabilities (including staff members who have served as designated leaders for projects/initiatives/departments that have adopted inclusive practices, people with disabilities who have worked for the organization, and staff members who are formal leaders of departments/areas/initiatives that do not have a record of adopting inclusive practices). Information gleaned from these initial interviews as well as the focused observations were then used to generate a further list of professionals to be interviewed. This second list included individuals who worked for areas identified as not addressing the inclusion of people with disabilities, individuals who were identified as champions for inclusion, and individuals who worked in areas identified as having attended to the inclusion of people with disabilities.

While the contact person at each site assisted with the coordination and scheduling of the professional interviews, this person was never informed of the final list of interviewees. Each interviewee was provided the option of not participating in the interview at the start of each interview session. In addition, some interviews were arranged without the contact person when such an option was possible. If there was a need to interview individuals who reported to the contact person, then the researcher contacted those individuals directly, without informing the contact person about who in their area was contacted or participated.

Observations of staff member interactions. A series of activities were observed at each site to explore how museum professionals interact with one another when developing and implementing museum educational experiences, particularly those experiences that promote the inclusion of people with disabilities. Activities were selected for observation so that collectively they represented a broad range of organizational areas (visitor services, exhibits, programs, etc.) and kinds of activities (team meetings, departmental meetings, and visitor interactions). Priority was given to those activities where it was expected that issues related to the inclusion of people with disabilities would be discussed or where staff members would be interacting with people with disabilities. In total, 22 activities were observed across the three site organizations (see Table 6 for details about the specific activities observed). While some activities were selected in consultation with the local contact, other activities were identified for observation through the professional interviews and the focused observations.

Table 6

Summary of Observed Professional Activities

Characteristics	Outdoor and Explore Museum	Large Science Museum	Urban Community Museum
Number of activities observed	5	7	10
Kinds of activities observed	Department meetings, Team meetings, All staff meetings, Conference calls	Department meetings, Team meetings, Professional development sessions	Department meetings, Team meetings, Professional development sessions, Conference calls, Programs
Number of activities where inclusion was discussed	3	3	4
Range for the number of participating professionals	4 to 40+	4 to 30+	3 to 20+

When observing these activities, the researcher aimed to serve as an onlooker, taking notes in the background and not participating in the discussions. However, on a few occasions, the researcher was asked by the participants to participate in the discussion. The researcher declined, except in instances where the topic was not related to the inclusion of people with disabilities (such as when a team was discussing a practice that was known to take place at the researcher's home institution). To protect the identity of the staff members who participated in these activities, direct quotes are not included in the case summaries from these activities, only overarching summaries of the activities themselves.

An email was sent out in advance to all affiliated staff members requesting their permission to observe the activity (see Appendix D for examples of the recruitment emails). If any staff member did not feel comfortable with the meeting being observed, he/she was instructed to contact the researcher directly so that the activity would not be observed and no one would know the reason why the observation did not take place.[4] Through this email staff members were informed in advance that an observer would be present during the activities and taking notes. The staff members were also informed of the purpose of the larger study, but were told that the observer was not solely interested in discussions regarding people with disabilities and further wanted to learn about the process the institution uses to develop its programs and exhibits.

It should be noted that, while it is the ethical thing to do, the process of informing the participants of the purpose of the study could have led staff members to take actions they might not otherwise take. The use of data triangulation worked to mitigate the

[4] No one contacted the researcher to request that an observation not take place.

effects of this bias. The potential for such a bias was also considered in the interpretation of the observational data.

Observations were directed by a series of sensitizing concepts related to the questions guiding the investigation. These concepts included the following: *Processes* of change (such as process for determining priorities and/or educational goals, theory-in-use versus theory of action, process for designing educational experiences, or who is involved in or referred to during the work); *Context* of the change (such as areas of contention/tension/financial stress, organizational history, local community, government, or policy); and *Kinds* of change (such as types of audiences discussed, perception of audience needs, design elements or educational practices considered, or types of documents generated).

Collection of documents and artifacts. The collection of documents focused on cataloging the range of actions the sites have taken to include people with disabilities in museum learning as well as describing the organizational context. Types of collected documents included: photographs of existing programs and exhibits; accessibility guides; visitor services materials (such as maps and menus that are made available to all visitors); formative and summative evaluation reports; and annual reports. Although an extensive number of photographs were taken at each site, these photographs are not included in this document so as to protect the identity of the participating science museums.

Data Management

Given the large amounts of data that were collected at each case, data management was an essential part of the research process. The lead researcher was

assisted in data management by a designated Research Assistant from the Museum of Science, Boston. Critical elements of the data management plan included the following:

- A spreadsheet that tracked the data collected during each site visit;
- The digitization of all collected data;
- Organization of the electronic sources by case and site visit number in a secured, electronic folder; and
- The analysis of the collected data using NVivo software.

Data Analysis

Data analysis was guided by Stake's (2006) protocol for multiple case study analysis. This form of analysis emphasizes a "case-quintain" dialectic (p. 46), where assertions are generated by looking closely at the findings from each individual case with regards to the meaning of the entire group of cases, and looking at the findings from the whole group of cases with regards to the meaning for each individual case. Through this process, Stake recommends that the researcher highlights not only the similarities across cases, but differences as well. True to the philosophy of case study research, which emphasizes the importance of context, Stake's protocol for multiple case study analysis is designed to illuminate how a certain phenomenon (in this study, a change toward inclusive practices) is the same and different across different contexts (defined as institutions in this study).

Findings from this study were presented using a structure that was consistent with Stake's notion of a case-quintain dialectic. Individual case descriptions were provided for each participating science museum, which included detailed information about the

organizational context. These descriptions were intended to provide professionals at other museums with insights on how the change toward inclusive practices might be the same or different at his or her museum based on the similarities and differences between the studied museums and his or her own. The diversity of contexts studied, therefore, strengthens the likelihood that museum professionals will see connections between their museum and the conditions present in the three case museums. Areas of similarity are detailed in Chapter 7, which describes the quintain. This chapter aims to provide the field with an understanding of common elements that could lead toward a change in inclusive practices at a variety of science museums. This chapter also details differences across the three museums when such differences yielded insights on the kinds of processes and contexts that facilitate, sustain or impede change toward inclusion of people with disabilities.

The initiation of the data analysis process was concurrent with data collection. Following each site visit, the researcher generated memos that listed emerging themes and potential patterns, and areas for further investigation. As certain themes or patterns were identified, the researcher sought both confirmatory and disconfirmatory evidence about these themes through additional data collection during future site visits. These memos were either written directly by the researcher, or were recorded by a Research Assistant at the Museum of Science to whom the researcher dictated her initial thoughts about each case.

After data collection was completed, more in-depth analyses were conducted case-by-case. Within case analysis began by looking in-depth at each individual case

museum through a process of categorical aggregation (Stake, 1995), whereby patterns were identified and then coded in the data related to the kinds of change that occurred, the processes that facilitated or impeded change, and the contextual factors that influenced change. The initial set of categories for the kinds, processes and contexts of change were based on the overarching frameworks for this research study, the social model of disability and organizational learning, as well as the findings from the review of the literature. These themes were revised and refined as the study progressed. This refinement began through the memoing process and then continued as the data from each case were read and re-read multiple times, and the guiding set of themes and potential codes were revised accordingly.

Consistent with the framework for *organizational learning*, strong patterns were considered to be those that were found across a range of organizational areas, or reoccurred across a number of different situations within the same organizational area. This study did not rely on direct counts for determining the strength of patterns or themes. This is appropriate given that (a) a purposeful (and not random) sampling method was applied to identify research participants; (b) certain areas of each organization were more represented at each museum than others (this was particularly true for organizational areas that had a strong history of inclusive practices); and (c) an interview guide was used (as opposed to a structured open-ended interview), which meant that not every participant was asked the exact same questions. Therefore, a reporting of the counts or instances of a certain remark, pattern, or theme across participants could lead to a misinterpretation of the meaning of the data for the organization as a whole.

In a parallel process, the researcher also examined the data to identify narratives related to organizational areas that were frequently discussed during the professional interviews. Narrative summaries were created for each of these organizational areas and then the kinds, processes, and contexts of change were examined and identified for these organizational areas. Comparisons were then made between the kinds, processes, and contexts of change that were identified for these individual areas and that of the larger organization as a whole. These comparisons were used to identify: (a) additional kinds, processes, or contexts of change that may have been unnoticed through the initial categorical aggregation; and (b) modifications or clarifications to the initial kinds, processes, and contexts of change for the organization as a whole.

Following the generation of the individual case summaries, the case-quintain dialectic commenced. First, themes related to the kinds of change and the processes of change from each case were coalesced into one list, and the case within which the theme was identified was noted. Areas of overlap and commonalities were identified as possible final assertions to include in the description of the quintain. Differences between the cases were then reviewed to see if such differences yielded insights into kinds of change and processes/contexts of change that facilitate, sustain, and impede change toward greater inclusion of people with disabilities. Interpretation of the meaning of these differences was then added to the list of possible final assertions. The list of assertions was then finalized by testing them against the evidence. Evidence that connected to the assertion (whether proving or disproving) was looked at in aggregate to determine if there was sufficient evidence backing the assertion and whether the evidence pointed to an

alternative interpretation. Only those assertions where there was sufficient evidence and limited alternative interpretations were included in the quintain description. Following the generation of the description of the quintain, the case descriptions were then revised with the intent of clarifying themes in the case as they pertain to the final assertions of the study.

Validity and Generalizability

A number of actions were taken to enhance the validity and generalizability of the findings. According to Maxwell (1992), key areas of concern for qualitative research include (a) descriptive validity (are the details of the researcher's account accurate?), (b) interpretive validity (has the researcher adequately captured what the described events meant to the participants?), (c) theoretical validity (is the account a valid representation of the theory the researcher brings to or develops through the study?), and (d) generalizability (does the study provide deeper understandings of situations in other settings or populations?). Based on this framework, a number of steps were taken during the data analysis phase of the research study to enhance the validity and generalizability of the findings, which are described below.

Member-checks. To enhance the descriptive and interpretive validity of the research study, staff members from each of the research sites had multiple opportunities to comment upon the findings of the study, thus ensuring that the details of the cases are accurate and that their perspective of the problem statement is accurately portrayed (Lincoln & Guba, 1985). Preliminary findings from each case were presented to staff members during the third site visit in the form of a PowerPoint presentation. Multiple

meetings were held to present these findings. To maintain honesty between the researcher and the participants, participants were told that they do not have the final say on the interpretation of the findings, but that their opinion would be considered in the final analysis. After each meeting, findings as described in the PowerPoint were modified, revised, or clarified based on discussions with staff members if the researcher felt either (a) the change connected to the descriptive validity of the study or (b) the proposed change reflected a legitimate alternative interpretation that was consistent with the patterns observed in the data.

In addition to the opportunity to participate in these meetings, each participating staff member was afforded the opportunity to review any quotes that were designated for inclusion in the case or quintain descriptions to ensure that they felt comfortable that (a) their identity was sufficiently protected, and (b) this quote aligned with their thinking about inclusive practices. Only a few professionals modified their quotes or asked that the quotes not be included in the report. None of these revisions influenced the overall findings from the study.

Peer reviews. To further enhance the interpretive validity of the research study, individuals from the museum field who have experience advocating for inclusion in a variety of museum types were asked to reflect upon the preliminary findings, particularly those related to the description of the quintain. The findings were presented to a panel of experts via a PowerPoint presentation that was delivered during a conference call. Any questions or comments raised during this conference call informed further data analysis.

In addition, one-on-one meetings were held with a few peer reviewers who were not able to attend the conference call.

Connections to the guiding frameworks. As stated in the two previous chapters, the two theories of organizational learning and the social model of disability were used as the guiding frameworks for this study. These frameworks informed the themes and questions that guided the initial investigation as well as the data analysis. During data analysis, organizational learning was used as a way of interpreting the processes of change, with the researcher looking specifically at how the organization learned to be more inclusive of people with disabilities. The social model of disability informed how the researcher examined the overall goals of the change and why such a change was needed.

A diverse set of cases. Although the cases were similar in that they each feature a science museum that has sustained a change toward inclusion, collectively, the set of cases represented a range of science museums in terms of sizes and educational practices. It is presumed, therefore, if similar conditions enabled change towards inclusion in these three museums, then one would expect to find these conditions in other science museums with established, inclusive practices.

Triangulation of findings across instruments and across cases. The key findings for this study were those that appeared across data collected by the various instruments and sites (Denzin, 1978). The purpose of this triangulation was to reduce the impact of the limitations or biases of any one instrument or site on the generated findings.

Ethical Considerations

There were a number of ethical considerations that informed how data were collected, analyzed, and eventually reported for this study. These considerations relate to three distinct areas: practitioner-participant considerations, disability-participant considerations, and research utilization.

Practitioner-participant considerations. There were four main ethical considerations that were considered with regards to the practitioner-participants: (a) that the study accurately reflected their experiences, attitudes, and actions; (b) that they experienced no professional or personal harm through their participation; (c) that their participation was voluntary; and (d) that they were not deceived with regards to the intent of the study and its findings (Newkirk, 1996). To address these concerns, participants participated in a preliminary review of findings (as described above in the member checks), and the researcher made efforts to be open and honest with the participants about the intent and purpose of the study (see the consent forms in Appendix E).

Every effort was made to protect the identity of the participants. While full anonymity of the case museums could not be ensured (there are only a small number of museums in the United States that meet the above-stated criteria), details about the cases were obscured whenever possible to ensure that the professionals could not be identified. Pseudonyms were used for both the names of individual participants as well as the names of individual programs and exhibits, and details about the individuals and the museum experiences were omitted when they were not relevant to the study findings. As complete anonymity could not be assured, however, participants were asked to keep this in mind

during both their interview and their review of the findings. In addition, as certain organizational identities make the participants more identifiable than others (such as "Senior Leader of Exhibits" where there may only be one person within the organization that holds such a position), each participant was provided the opportunity to change his or her stated identity if he or she wished.

When an organization is participating in a study, it can be difficult to ensure that the participation is voluntary for all members of the organization, as some lower-level staff may feel pressure to participate by their managers. For this reason, managers were not notified with regards to the identity of the people in their departments who participated in the study, and the names of participating individuals were not shared. This served to both protect the anonymity of the participants, as well as ensure that there was no negative retribution to individuals based on whether or not they chose to participate in the study.

A further condition of a study being voluntary was not just that the participants were free to choose whether or not to participate, but also that they were aware of what kind of study they were participating in. Therefore, the researcher made every effort to clearly communicate (both in written and oral forms) the intent and purpose of the study to potential participants. Included in the intent was the notion that this study was looking to gain an understanding of the problems (and not just the solutions) that create situations where people with disabilities are excluded from science learning in museums, and that, therefore, some of the findings may not portray the museum in a positive manner.

Disability-participant considerations. People with disabilities are a historically marginalized group that, in the past, has been exploited for the purposes of research. When including people with disabilities in research studies, care should always be taken to make sure that their inclusion in a study is to the benefit of the disabled community, and not to the benefit of the non-disabled community at their expense. As this study focused on generating findings that are relevant to the improvement of educational conditions for people with disabilities, it can be assumed that this study was conducted for the benefit of the disabled community and, therefore, the inclusion of people with disabilities as study participants was warranted.

The rallying cry of the disability rights movement is "Nothing about us without us" (Longmore & Umansky, 2001). This protest statement stems from a long history of people with disabilities being excluded from decisions about their lives. For this reason, not only was the inclusion of people with disabilities in this study justified, it was essential. People with disabilities participated in the study through the focused observations, professional interviews, and the peer review process.

Another area for consideration when working with people with disabilities is informed consent. To make sure that all participants were informed about the study and their participation as adequately as possible, consent forms were made available in multiple formats, including Braille and large print. If someone was unable to read the consent form, it was read aloud to them. Signature guides were also made available for people who are blind. If a participant had a severe cognitive disability or is a child in a family group, extra steps were taken to make sure that the person understood the purpose

and intent of the study and areas for potential harm. A process of co-consent was utilized for these individuals, whereby the person was encouraged to discuss their participation with his or her caregiver and they jointly decided to participate or not (Iacono, 2006; Ramcharan, 2006).

Research utilization. Given the substantial time commitment required by the participating museums, an important ethical consideration was to ensure that these museums received some benefit from their participation. As stated by Miles and Huberman (1994),

"Even if a study's findings are valid and transferable, we still need to know what the study does for its participants, both researchers and researched . . .it's an essential addition to the more traditional views of 'goodness'" (p. 280).

To ensure that the research findings were useful for the participating institutions, efforts were made to communicate the findings to each of the participating organizations in a way that might be useful for informing later work. As discussed above, preliminary findings were shared at each site during multiple meetings and delivered via a PowerPoint presentation. In addition, a Research Assistant at the Museum of Science, Boston generated memos for each organization that provided detailed information about the accessibility of the museum, as described by the individuals who participated in the focused observations. These memos provided information that was very specific to each museum (such as which exhibits were and were not at a height that was accessible to wheelchair users or which video's captions were difficult for an individual who is

d/Deaf[5] to read) and were not directly relevant to the findings from this study.[6] The decision to provide such memos to the site museums was based on requests made by the participating professionals, who saw this information as being the most useful and informative to their work. The final report will also be delivered to the site contact via email, who can then distribute it throughout the organization.

Another way that research utilization was attended to was to invite professionals from the site museums to attend the focused observations with the people with disabilities. This was enacted so as to reduce the time delay between data collection and the potential for action. Only one of the three case museums took advantage of this offer and participated in these focused observations, which was the Outdoor and Explore Museum.

Limitations

A limitation of this study was its narrow focus on science museums, rather than a broader range of museum types (children's museums, art museums, history museums, zoos, aquariums, botanical gardens, etc.). Study findings, therefore, extend only to science museums, with an expectation that this study can also serve as a basis for future studies that explore the interactions of change in other kinds of museums. The decision to begin this line of investigation by focusing on science museums was based on the researcher's experience working within a science museum for the past 17 years, as well

[5] "Deaf" refers to an individual who self identifies with Deaf culture, whereas "deaf" denotes an individual who is unable to hear, but does not identify with Deaf culture. "d/Deaf" is used to capture both categories of individuals. In the study, "d/Deaf" is used unless the term "deaf" appears in a participant's quote (it is presumed that most participants are not familiar with the d/D distinction) or a participant specifically reports he or she is culturally Deaf.

[6] An example memo cannot be provided as it would reveal identifying information about the participating museums.

as the availability of existing field-wide data that can be used to support the findings that emerge from the study of these three museums (Reich et al., 2010). Another limitation relates to the sizes of the participating museums, with medium-to-large-sized museums participating, but not smaller museums. Findings from this study, therefore, may be less relevant to smaller science museums.

An additional study limitation is that the focused observations only included individuals who self-identify as having a disability. This was necessary as other methods for determining whether an individual does or does not have a disability are not appropriate for museum settings, such as requiring a medical test or asking questions about an individual's functionality.

A final limitation is the study's reliance on personal accounts and historical documents to describe the process through which a change toward inclusive practices came about, rather than direct observations of change over time. While such direct observations may have provided a more accurate interpretation of the change process, it was not possible to conduct this study in this way at this point in time. First, given how little was known about this topic, it was difficult to determine at the outset if such a change was likely to take place at a given museum, so many museums would need to be studied with the hope that at least one would successfully achieve a change toward inclusion. Second, the field does not currently know how long it takes for a museum to change its practices, so such a study may have taken many years to complete. Study findings have generated deeper understandings of the conditions that will likely lead to a change toward inclusion and also the length of time needed for such a change to occur,

thus making it more likely that a study that directly examines change over time could occur in the future.

Chapter 4: Outdoor and Explore Museum (OEM)

This case description portrays the work toward inclusion of the smallest of the three museums studied, the Outdoor and Explore Museum (OEM). The case begins with a depiction of the overall organizational context. It then continues by looking at the inclusion of people with disabilities at this site through the perspective of four lenses. These include the reactions of a visitor with a disability to the Museum; the experience of a volunteer with a disability who works at the Museum; the actions of a cross-organizational team that is known internally for its inclusive practices; and change over time in the inclusive practices of a specific department, Exhibits. The case ends with a summary of what can be learned about change toward inclusion of people with disabilities at this site by looking collectively across all four lenses.

Context

The Outdoor and Explore Museum (OEM) features interactive, hands-on exhibits and an extensive outdoor, living collection that includes both live animals and botanicals. Although the city within which this museum is located is large, the surrounding community has a suburban feel, with individual homes on tree-lined streets being the Museum's closest neighbors.

The Association of Science-Technology Centers (ASTC) considers OEM to be a "medium-sized" science museum due to its operating budget of $6 to $7 million (ASTC, 2008). However, OEM has a rather large campus that includes acres of land and close to 100,000 square feet of indoor exhibit space. The number of visitors the museum reaches is just over 400,000, which includes families, school groups, and a new audience for the

museum—adults—who are largely from the surrounding area, but includes some tourists as well.

OEM has recently undergone a period of rapid growth. According to participating staff members and statements in the museum's annual report, in the last 10 years large amounts of the campus were renovated with new outdoor exhibitions produced; the operating budget increased; and the rate of visitation almost doubled. The renovations were largely supported through bonds from the local government (from which the museum receives substantial support). Staff members attribute the increased visitation largely to the museum's emphasis on museum members and the encouragement of repeat visitation.

OEM's culture can be best described as one that focuses on service and safety for visitors and fosters collaboration amongst its staff members and volunteers. The focus on service is evident in the actions and statements of the Museum's staff members. "Service" is listed as one of the official core values of the organization in the Museum's annual report and is described by the President as a "customer orientation, realizing that people have different needs, different wants, coming in our front door and we try to serve all of them." The focus on service is echoed in statements by others in the organization, such as one Maintenance professional who states the following "we all have the same values in making sure the visitors have the best time they could possibly have when they are here." There is also a cross-organizational team that meets regularly to determine ways to minimize the impacts of routine maintenance and site improvements on the visitors' experience.

The focus on safety, however, is more implicit. According to the Museum's President, "Before I came here to this institution, it was well-ingrained that we had to have safety practices." This focus on safety is manifested in the existence of an inter-departmental Safety Committee. Staff members frequently mention this Committee's work during their interviews.

The collaborative nature of the work environment is evident in both the actions and statements of staff members. According to the President of the Museum, "We have a highly collaborative staff; it has been that way all along. . . . Working collaboratively within teams that are cross-departmental has become a more and more natural way of working here." Another Senior Leader within the organization describes the organizational culture as "kind . . . there's a lack of [an] instinct to . . . point out other's weaknesses." Most efforts are led by a group of individuals from different organizational areas who come together to collaboratively address specific aims. Examples include not just the two committees cited above (the Safety Committee and the Renovations and Maintenance Committee), but also a Green Committee (that focuses on issues of environmental sustainability) and a Staff Welfare Committee. Cross-organizational work seems to be the norm. As one Human Resources professional states, "There doesn't seem to be much that happens . . . that doesn't involve at least one other person besides whoever's idea or job it is."

This culture of collaboration extends beyond intra-organizational committees to also include collaborations with other museums. OEM collaborates with a number of other organizations, including partnerships with local universities, collaborative

agreements with other museums within the state, and joint projects with other science museums across the nation.

> We work with museums, mostly on a national level. I'll start with the state. We're part of what's called the [State name-affiliated] Science Museums Collaborative. So that is 27 museums that receive funding through the state and some additional who are funded in other ways through state dollars, 32 organizations in all. So we do collaborative projects, for instance, we at OEM receive some [name of federal funding agency] grants to do projects that impacted all of the collaborative. . . . We partner with museums nationally on projects like the [name], and have been in a number of funded projects with museums nationally, as well as with university partners. (President of OEM)

Understanding the context of OEM—an organization with a medium-sized budget and staff, large campus, a recent period of rapid growth, and a culture that supports service, safety, and collaboration—provides a backdrop for understanding the work and change toward the inclusion of people with disabilities at this science museum. To gain further insights on this organization and its change toward more inclusive practices, a variety of lenses are used to look at the organization from different vantage points.

Viewing Inclusion through the Lens of Rich's Experience Visiting OEM

Rich is a frequent Outdoor and Explore Museum (OEM) visitor who has low vision. He explains in an initial interview that he is a member of the museum and visits two to three times a year with his three-year-old grandson. When asked what he sees as

some of the positive aspects of this museum with regards to inclusion, he begins by describing his experience already at the Museum that day:

> First off, the handicapped parking is very convenient. It's right outside as you come in. And that made it easy for us to get to a sidewalk, to walk from the car to the front door, and that's very important for someone like me. . . .I can tell there are large crowds here today from the amount of people I hear and also things are moving around me. I thought that there was no congestion as we approached the front desk and I gave them the letter, telling them I had the meeting with [staff member in Visitor Services]. That was no problem, they immediately picked up on it, they were aware. That's very important, too. And they knew she wasn't here and I would be seeing you. The ride up in the elevator was very convenient for me. I can use stairs, but the elevator is very convenient.

Rich goes on to describe how he appreciates the availability of the staff members on campus who always seem ready to assist when needed, and who also seem to have some understanding of ways to work with people with disabilities:

> I can't think of any place that I've been that I didn't think somebody was right there in the immediate area in case there was a problem. I guess, carrying a white cane, you kind of stand out more so than say, someone who has hearing difficulties might. But, here, they do know what a white cane is.

As the interview continues, Rich describes other aspects of the Museum he finds particularly inclusive, such as the wide open pathways in the outdoor exhibitions:

> I like the way the sidewalks are so wide. That's a very good point for the Museum, because you do have little kids that are gonna get in a hurry, they wanna run and that kind of stuff. [My grandson] will hang back and hold my finger to lead me around and make sure that I keep up with him, but then when he wants to stop and see something. There seem to be enough overlooks, so I haven't had problems at all with finding a place to get out of the main flow of people.

When asked about exhibits or programs that he thinks work particularly well, his response does not connect directly to what is accessible, but rather focuses on the interests of his grandson—the trains, dinosaurs, farm animals, and sailboats. As Rich explicitly states ". . . if he's interested, I'm interested." His grandson is also on his mind when he talks about feeling safe in the Museum environment:

> Seeing this train, it's—I felt I was comfortable with it . . . I felt safe and I felt he was safe, and I thought the people were paying a lot more attention than they would, say at an amusement park, where they are just shuffling the people through.

This is not to say, however, that he finds all areas that his grandson likes to be particularly comfortable and accessible. When asked about parts of the Museum he finds particularly uncomfortable, unwelcoming or inaccessible, he again lists one of his

grandson's favorite areas, which happens to be one of the oldest exhibitions on the Museum's grounds:

> The areas where they can play drums or bells or all those things. . . . For me it's disconcerting. I kind of hang back in those areas, but he loves it. . . . He's very much into music and making noise. . . . It's just hard for me on the hearing part, the noise . . . I can't *not* have some sense of what's going on around me. So, the kids are enjoying it and I think that's a great thing. For me, personally, it's uncomfortable and I just stay back and that's not difficult to do.

When asked about access features he's seen at other museums that he wished OEM had, he goes on to describe the audio tours he's experienced at other museums and historic sites:

> I don't know here if they have walking tours, you know, using a cassette player or, of course, now a digital would hold a lot more. Those have been important to me at other places, especially places where you have to drive through to see all of an exhibit, especially battle grounds and that kind of stuff.

After the initial interview, Rich explores the Museum's grounds. As he walks along the Museum's outdoor path, he notes where his grandson's favorite exhibitions are as he passes them. He states that he has a clear map of the Museum and the outdoor grounds in his head. He also reports that he alternates between using a white cane and a

seeing-eye dog when he visits the Museum, and when he brings his dog here, he has never experienced any difficulties.

At one point during the observation, he heads toward one of the newer outdoor spaces, a live animal-based exhibition that staff members at OEM report as one of the most accessible on campus. This exhibition consists of a long, sloping board walk that directs visitors to various areas including a small pond and three different enclosures that each house one kind of animal. As Rich approaches the exhibition, he notices one of the overlook points. It is pointed out to him that this area contains a map of the exhibition that is accompanied by an audio descriptive label. The audio descriptive label (or "ADL" as OEM staff members call it) provides auditory instructions through a speaker. When asked if he knew about this feature, he says he did not—no one ever pointed it out to him before. He then plays it and says that it was a good description and is very similar to the audio tour he suggested during the introductory interview.

As he continues to walk down the ramp, he detects another overlook that is similar to the one that had the map placed inside of it, and Rich assumes that this overlook will also have an audio descriptive label. It does not. He then expresses the importance of consistency for people who are blind. He continues to walk down the ramp to another overlook where there is an ADL and a series of animal footprints you can touch. Rich leans over the footprint display and brings his eyes close to the sign. He then plays the ADL (each time pressing it multiple times to get it to start). While it plays, Rich feels the footprints. Some younger children come over and start to press the buttons that say what the footprints are, and this audio plays at the same time as the main audio label

Rich is listening to. Rich, however, continues to touch each footprint and press the corresponding audio button in turn, working his way down the bank of tactile models. After the audio announces what animal made the specific footprint, he makes comments like “ah, golf cart geese” or nods in acknowledgement.

He then walks down to the first animal enclosure, which houses a bear. Here, there are a number of multisensory exhibit components he interacts with, for example, a preserved bear scat you can touch and parts of the bear’s diet that you can smell. Rich notes that there is inconsistent use of the ADL’s in this area—some exhibit components have them, others do not. For example, while he can feel the bear scat, he doesn’t know what he is touching. The smell station has an audio label that tells him what to do, but the label does not tell him what the object is that he smells. Rich tries to determine if there is a discernible pattern that will tell him where an ADL is—is it always on the round kiosks? No. How about the yellow kiosks (he can see some colors)? No.

Rich also uses the computer kiosk in this area. This kiosk, which has tactile button controls and auditory and visual outputs, is specifically designed for people who have low vision. Rich begins by pressing the volume button, but nothing happens. He assumes that either the kiosk is broken or not accessible until the audio assistance button is pointed out to him. He then presses the button and listens to the audio as it describes the purpose of each button on the kiosk. As he listens, Rich feels each button in sequence. After the audio description is complete, he again presses the buttons and scrolls through the options on the screen. He selects “bears in the wild.” He listens to the description, and then presses the home button to go back to the main menu. He makes a few more

selections. At the end, he says that the computer is very well done and easy for anyone to use, even if they do not have computer experience. He points out, however, that the "big thing is getting attention to that [points to the audio assistance button] . . . visually is not going to work."

He continues to walk along the boardwalk, stopping at various interactive stations along the way. Eventually, he leaves the boardwalk and heads along an uphill path that will take him to another exhibition area that is one of his grandson's favorites. Rich points out a hazard on this path—an area on the ground where tactilely there is not a detectable difference between the asphalt and the grassy area. He says that a better system is needed, perhaps making the non-trail area slightly elevated or adding a fence. He also notes, however, that this is the only unsafe area he has noticed on all of the trails. Generally he feels the trails are quite well done with substantial tactile indicators on the edges of the path.

As he continues to walk along the trail, the Museum's golf cart, which staff members report using to transport people who need assistance from one area of the campus to another, passes by. It is filled with older adults who are being driven around by an education interpreter. When asked if he knew about the availability of the Museum's golf cart service, Rich says he did not, but it is not a service he generally needs or would use anyway.

Rich continues on to another exhibition, stopping to use some of the multisensory exhibit components in the sailboat area. These are the last exhibit components he interacts with before he walks back down the hill toward the main museum building. As

he gets back to the building, another person presses the automatic door button to open the door. Rich is surprised to learn about the automatic doors—he much prefers automatic to manual doors, and he plans to use these in the future now that he knows they are available. Once inside the Museum, Rich meets up with his wife. She asks Rich how his visit went. He tells her that he "learned a lot."

Connections between Rich's experience and other visitors with disabilities. Rich's experience in many ways aligns with the experiences of other participating visitors with disabilities, as well as participating staff members' perceptions. Many of the attributes Rich enjoys and appreciates about the Museum—such as the multisensory exhibit components, wide pathways and ramps, a policy for service animals, audio descriptive labels, automatic doors, designated parking spaces, accessible technologies, safety, and helpfulness of the staff — are those that other visitors with disabilities express appreciation for or that staff members mention as purposeful actions taken to make the environment more inclusive of people with disabilities (see Table 7).

The comments staff members and other visitors make about the attributes Rich enjoys show that different individuals cite different reasons for why the same features contribute positively to the experience. For example, while the multisensory aspects of the exhibitions (especially the audio and tactile elements) provide Rich with a key mechanism for interacting with the exhibitions that could not be achieved through visual elements alone, for another visitor who is a mom of children with severe allergies, it is these same "hands-on, physical things" that she attributes to the reason why her children "love" the museum. Similarly, while Rich finds the automatic doors easy to use given the

fact that his hands are already occupied with a cane and/or a dog when walking around the Museum's campus; visitors who are wheelchair users find these buttons essential for opening doors from a seated and wheeled position.

There are other positive features of the Museum that are not mentioned by Rich, but are mentioned by other visitors with disabilities or by staff members (see Table 7). Seating, for example, is mentioned as an important feature by other visitors and by staff members, but does not appear to be as important to Rich. Attention to measurement requirements of individual exhibit components is also more important to other visitors and staff members with disabilities than to Rich. Certain services, such as the golf cart that transports visitors throughout the campus, are critical to other visitors and are mentioned as intentional actions for inclusion by staff members, but are not necessarily part of Rich's experience. The multisensory aspects of the Museum's programs as well as the frequent practice of asking parents whose children participate in courses and camps about their children's preferences or needs are also actions that Rich does not mention in his interview, but are mentioned by the individuals who offer programs at OEM. In addition, the behind-the-scenes actions taken by staff, such as the involvement of people in the work and professional development offerings, are also (perhaps understandably) not mentioned or noticed by Rich during his visit, but are actions mentioned by staff members.

Similar to Rich, accessibility is only one aspect of the museum experience that the visitors with disabilities value about OEM. One visitor who has limited mobility states that it is the diversity of offerings she appreciates, "That's what I love is there's so much

here that you literally could come every day, spend a couple hours and there's something totally different." Another visitor who uses crutches prefers one area of the Museum more than another not because of its accessibility, but ". . . because [my children] enjoy it. I think that's why I like it. It's a place to go for 20 minutes and let them play." Yet another visitor who has low vision prefers one area over others because of the content, "I find the animals out there—past the boardwalk, around the boardwalk, the wolves—the whole history behind what they were doing there I thought was really interesting." Still another visitor who uses a wheelchair prefers certain areas because of the experiences they offer, "I like the butterfly exhibit because I can see all different butterflies, and I like the tornado because I can put my hand in it."

As noted above, although Rich thinks that "this is a great museum," he also acknowledges that there are certain areas for improvement. Here again, his thinking aligns with that of other visitors with disabilities and staff members. Similar to Rich, other visitors mention that they occasionally find unsafe situations at OEM, that background noise can be distracting, and greater communication is needed about OEM's accessibility offerings. Similar to what is described above about the positive attributes of the Museum, although visitors with disabilities all mention a common need for a certain change, the reason for this need sometimes varies between visitors. For example, multiple visitors express a desire for greater communication about the accessibility features OEM offers. For Rich, this communication focuses around the availability of the ADL's. For other visitors, learning more about services such as the golf carts is critical.

Table 7

Actions Taken/Not Taken to Make OEM More Inclusive of People with Disabilities

Action Taken	Inconsistent Action	Action Not Taken
• Wide, level outdoor paths and ramps • Automatic doors • Ample seating • Elevators • Captioning • Designated parking spaces • Attention to measurements • Multisensory interactives • Accessible technologies • Free golf carts, wheelchairs, and strollers • Policy for service animals • Staff are available to help • Multisensory program activities • Asking parents about children's needs and preferences for sign-up programs • Professional development for staff • Involving people with disabilities in work • Free admission on certain days	• Audio descriptive labels • Attention to safety • Interpretive images • Tactile cues in exhibitions • Labels with large, high contrast, easy to read fonts • Maintenance of accessible exhibits	• Braille or large print guides • Accessibility of drop-in programs • Lighting • Communication with visitors with disabilities • Background noise distracting • Attention to allergies

Staff members and Rich are in agreement about the need for more audio descriptive labels. Staff members, however, further identify two areas that are not discussed by Rich or other visitors with disabilities: the need for large print and/or Braille guides, and the need to improve the accessibility of the Museum's drop-in programs.

There are also a number of problem areas that are mentioned by other visitors with disabilities that are not a concern for Rich. These include uneven lighting and lack of attention to food allergies. Other visitors and staff members also point out some inconsistent practices throughout the organization. For example, another visitor who has low vision notes that there are a few areas within the indoor galleries where there is a lack of a defined and clear pathway. A visitor who uses a wheelchair notices that in certain areas of the facilities, maintenance workers do not always keep accessible pathways clear. Staff members concur that maintenance does not always think about accessibility in their practices. Although infrequent, there are a few situations where the needs of visitors with disabilities do not align. For example, one visitor who uses crutches feels unsafe on some of the same sloped surfaces that Rich and wheelchair users report as easy to use and essential for navigation through the exhibition areas.

Overall, Rich's experience provides descriptive insight from the visitor's perspective about the actions taken or not taken by OEM to make the museum experience more inclusive of visitors with disabilities. This description, however, only tells part of the story and does not address what the experience is like for the volunteers and staff members who work for OEM. To learn more about this aspect of the organization's inclusion, the lens of Seth's experience can offer some illumination.

Viewing Inclusion through the Lens of Seth's Experience as a Museum Volunteer

Seth is a quadriplegic wheelchair user who volunteers in the Museum's insect area. He brings an assistant with him when he volunteers. As Seth describes, his role is to ". . . show off bugs, arachnids, and other things that talk about the bugs that are on display. Any question that people have, I answer them. And that's pretty much what I do."

The insect area where Seth works has a very long and windy ramp that descends down to the main building. This ramp crisscrosses over a very large set of stairs. At the end of the stairs and the ramp are the doors into the facility, which can be opened using a large push button that has a large wheelchair symbol on it. Inside this building is a humid, tree-lined conservatory, as well as a separate room for insects that are housed in glass cases that looks more like a traditional museum exhibition. Seth works in both areas. There are push buttons that activate all doors in the building, and the internal pathways are smooth and easy to navigate.

When asked to describe his role at the Museum and how long he's worked there, Seth responds by acknowledging that things have not always been so easy:

> I've worked [in the Insect area] for about a year and half . . . and before I worked here . . . I worked at the lab in the other part of the Museum and . . . I didn't enjoy [that] as much as I've enjoyed this part . . . just because the lab is not very conducive to a wheelchair . . . there's a big lab desk . . . and it's hard to get around there . . . [and] get up close to interact with people.

Eventually, Seth "talked to the volunteer supervisor" and "a number of things . . . came together" that led him to seek out another area to work. He decided on the insect area because "I liked what I saw of the place and it's just [the] right people and right time."

OEM staff members acknowledge that Seth's experiences as a volunteer have not always been positive. A staff member who had worked with Seth when he first started to volunteer at the Museum describes his experience as follows:

> [Seth] didn't have trouble on a visitor end. He had a little more trouble . . . being on the presenter side, navigating around the spaces . . . some being my office because it's a little more cluttered than the museum floor is. So he's also not able to use his hands, and from a facilitation point, we had to kind of move around to a couple different exhibits until we found one that worked well with him. We tried him in the [exhibit name], and that's a very hands-on room. We tried him in the lab which is another one where . . . I'm always using my hands with the visitors and he's . . . just quieter and so . . . that combined with . . . his physical disabilities made it a little difficult for him to engage the visitors and so eventually he moved to the [insect area] which is something where there's less hands-on and more explaining. So I think that that was, out of all the exhibits, we have the best fit there for him as a facilitator. (Programs professional, OEM)

Despite this initial negative experience, Seth feels that the Museum is quite accessible:

> I feel like that the . . . Museum as a whole is accessible. There's elevators, and they try to keep things accessible as possible. And I can't think of any place in particular that's not accessible . . . I think the only complaint I really have is the—that lab area, but I mean it's not a big complaint because I actually like working this part of museum better, so . . . I mean . . . I can get up close to all the exhibits basically . . . . And people are always very accommodating.

Seth acknowledges that not all areas are accessible to wheelchair users, but he feels this is understandable:

> There's one other thing that's not accessible . . . to wheelchairs. . . . There's a shuttle re-entry craft that you can climb into. . . . It's not accessible to wheelchairs, but at the same time I don't think it really needs to be, 'cause it's for kids to get a sense of it, not for adults to get a sense of it. And there's nothing really in there other than a place for kids to hang out basically. It's really, really it.

Seth's comfort with the accessibility of the Museum is perhaps best exemplified by the fact that the reason why he volunteers at the Museum is because of positive experiences he had here when he was a child, "This Museum has been around since I was born, and I've been going here constantly . . . I've always really been interested in the Museum."

Despite this interest, he did not look for a position at the Museum until a job coach encouraged him to pursue it. According to Seth, this coach helped him to secure a

position through her "connections and persistence," which got "her foot through the door and me through the entrance."

Overall, Seth reports that his experience has been very positive and that he benefits from his position at the Museum in a variety of ways:

> I get to interact with people . . . a lot more than I do in my life and I . . . enjoy that . . . I have always [had] a love for animals . . . and even for bugs, it's the smallest to the biggest. I enjoy going out into the butterfly house. It's a lot warmer than the rest of the Museum, and I get to do that along with showing off insects and—because they're used to that environment. It's kinda a nice way to get out there because it benefits them and me. . . . And there's usually more people there so I can explain more about the insect or arachnids.

Staff members' statements suggest that they value Seth's involvement with the Museum. They express that his volunteering efforts are important not only for Seth, but also for the visitors and for the staff members who work with him. As a Human Resources professional who works indirectly with Seth states:

> I have my moment like probably a lot of people do when working with people with disabilities. You are kind of like, "Oh wow, I had assumptions about you that are completely untrue, and I should learn to get over those assumptions." I think that probably seeing Seth interact with other visitors who are in wheelchairs, that was cool. Kind of seeing that impact that

exists for people who are like, “Oh, you are just like me,” because I hadn’t really seen that before.

When asked whether he thinks staff members at the Museum share common values or beliefs related to inclusion, Seth responds as follows:

> It just seems like everyone’s welcome here and I really—never really seen any restrictions based on anyone’s—based on anyone’s life choices, be they religious or otherwise, or their diseases they have.

When Seth is asked if there is one thing that should be taken away from his interview, he emphasizes in his response “just how much the Museum’s modernized and made it more accommodating for people in general.”

Connections between Seth’s experience and other Museum volunteers, staff members or consultants with disabilities. Seth’s experience at OEM is in many ways not a unique one. Interviews with staff members reveal that there are many people with disabilities who volunteer at OEM in a variety of capacities, including as interpreters in the “lab” area described above as inaccessible for Seth, as well as assistants for the Animal Care department. Similar to Seth, other volunteers with disabilities, especially those working in the Animal Care area, are often accompanied by a personal assistant:

> We do have volunteers occasionally that will . . . ask us if they can volunteer in the Animal department, with disabilities, and we try our best to accommodate those volunteers. Often times they will come with a coach or their parent, someone who works with them on a regular basis, so that they can help that volunteer as they learn the job. . . . And really, often

times, the coaches help a lot. Ultimately, it is up to us to do the training and to show all of the volunteers how to do the tasks that we do here, but when the coach is there and learns alongside the volunteer, then it helps that they can work with that volunteer every time that they come. (Animal Care professional, OEM)

There are other OEM volunteers with disabilities, however, who work successfully on their own:

I also had one volunteer with a developmental disability for about . . . a year and a half [to] two years . . . I didn't want him to come and volunteer here and get stuck into the traditional mop and clean the floor . . . so we were able to have him work on some projects and even develop some activities and do some facilitation with our visitors. I also have one volunteer currently who's deaf and . . . he . . . took the most control over the accommodations that we needed to make. He's very comfortable. He's in high school and he works at a grocery store and so he's very comfortable working with complete strangers and communicating with them . . . I guess I just didn't know what to expect exactly when we had him in an exhibit, 'cause he's at an exhibit and he's completely by himself. . . . He really surprised me in how well he communicates with the kids and . . . their receptiveness to him. . . . It's been going well. (Programs professional, OEM)

For some of the volunteers, particularly those who work in the Animal Care area, the opportunity to volunteer at OEM is considered by staff members to be a form of therapy where they can increase their skills and abilities while also contributing to the organization:

> We feel . . . it's important for [volunteers with disabilities] to have opportunities like that. I personally think it's great because I've heard that animals can really help . . . that often times working with animals can kind of help rehabilitation because there's just something about that connection—that experience—that you have with the animals that helps you to thrive and do better, whether it's healing or learning or whatever that might be. (Animal Care professional, OEM)

A staff member in the Animal Care department reports that she's attended "a student's IEP meeting at their school to talk about what they have done with us . . . and why it was important." Staff members in this department also report that they specifically provide volunteers with disabilities with tasks that help them to develop needed skills. For example, one Animal Care professional reports, "We put this young man in the farmyard doing locks. Literally, just had him do locks to help with his fine motor skills."

Seth's story also points out how the involvement of people with disabilities in the Museum's work creates a reciprocal relationship. Not only do the individuals with disabilities benefit, but so does the Museum's staff. Working alongside people with disabilities—whether as volunteers, consultants, or staff members—is a learning experience for many staff members. As one Animal Care professional reports, "This job

has definitely given me more interaction with people with disabilities than I have anywhere else in my life. So that, I feel, is great. . . . It has helped me to learn better how to work with people with disabilities." A professional who works in Human Resources similarly feels she has had positive experiences at the Museum when interacting with people with disabilities:

> Inevitably with my volunteers who are disabled as well as our volunteers who are abled, I just feel that they are exciting people . . . and so many interesting things that happen. . . . Our volunteer with a cognitive disability . . . was telling me about this lawnmower business he wanted to start and the way he thought about it and everything else I was totally impressed.

Seth's story describes how the Museum worked with him to find an area of the organization where he could successfully contribute as a volunteer. Staff members' comments suggest that Seth's situation is not unique—a great deal of attention is paid to making sure that individuals with disabilities are placed in areas that match their skills and interests. A Human Resources professional reports that placing volunteers is "about making the volunteers comfortable with what they are doing . . . that then in addition they will be actually able to contribute." Similarly, an Animal Care professional states the following:

> We basically just try and set those volunteers up with what we feel they can take on. . . . We . . . match them with what seems to be the best in terms of . . . the abilities that they're coming in with, and trying to also

> give them something to strive towards. . . . We typically don't have to do anything to change our environment; it's really just a matter of finding the place that's best suited for them.

This philosophy extends beyond volunteers and also addresses how the organization is thinking about the involvement of people with disabilities as staff members. Following what is required by the Americans with Disabilities Act (ADA), OEM staff members are working to list out exactly what skills and abilities are needed for each staff position, encouraging managers to think broadly about the kinds of ways a certain type of job could be accomplished:

> I worked hard on the job descriptions as they [came] up for renewal to ensure that ADA compliance requirements are included. . . . So I talked with my supervisors and [said] . . . "Does this person have to be able to walk? For example, if we had someone who is in a wheelchair, or someone who has limited walking abilities, will they still be able to do the job?" (Human Resources professional, OEM)

The process of making determinations about the kinds of skills and abilities that are needed for each position is not an easy one, staff members report. In some cases, staff members say they do not know enough about what is possible for people with disabilities to make such determinations before the person enters the position, such as the situation with Seth's initial placement. The person who is charged with overseeing Human Resources is working with the managers to help them better make these determinations, but such a process takes time and is not yet consistent. Sometimes, one manager sees a

barrier where another already has a solution. For example, one staff member is concerned about hiring a volunteer who is d/Deaf because "I think about deaf and the ability to communicate—how that would work in our department?" (Animal Care professional, OEM). Another staff member, however, has already hired an individual who is d/Deaf to serve as a volunteer in her area, and she and this volunteer have developed a working system for on-going communication:

> So when [the volunteer who is d/Deaf] came in initially, I met with him and his translator and I assumed at first that [the translator] was gonna be coming to all of his volunteer sessions, which she came to the first one and that was it . . . I came to our initial meeting with some ideas [about communication such as] "We can have . . . some standard things you'd say in this room . . . I can write them down and you have them written out to show people," and he said "No." So, I figured it was better to just go with what he knows. . . . He's completely comfortable in there. It's the building room . . . [and] he just kind of jumps in with [visitors] and starts building. And when we communicate, I typically just type on the computer. He can read lips fairly well. (Programs professional, OEM)

In summation, Seth's story depicts how OEM involves people with disabilities in its work, describing the experiences of an individual who has a more intimate relationship with the organization than visitors such as Rich who visit only a few times a year. Combined, these two lenses—that of volunteers with disabilities and visitors with disabilities—provide an indication of the kinds of actions OEM takes and does not take to

make the environment more inclusive of people with disabilities. But what are the processes and contexts that facilitate actions toward inclusion, and what are the processes and contexts that pose barriers or impede further action? To gain deeper insights here requires a closer look at the workings of the organization and its various departments and teams.

Viewing through the Lens of the Safety Committee

The Safety Committee at OEM is a cross-departmental committee that oversees the Safety program at OEM and is dedicated to ensuring that OEM provides a safe environment for its visitors and staff. While its connections to practices related to inclusion are not immediately clear, numerous staff members mention this Committee's actions during their interviews as being highly relevant to the work of inclusion. As one Senior Leader of the Museum states:

> [The Safety Committee] is actually a very good example of what you were asking earlier actually. "In what ways this inclusiveness permeated to other areas of the museum?" and . . . this committee is a cross disciplinary committee. It's comprised of people all over the museum; its reach is into every department.

Observations of a Safety Committee meeting confirm that almost every area of the organization is represented on this committee, including people who work in Exhibits, Facilities, Programs, Marketing, Human Resources, Finance, Animal Care, and Administration. During the meeting, members discuss a broad range of safety issues, such as problems with the donkey being fed human food by visitors, a staff member who

fell off a small electric motorcycle while on campus, a keeper who was bit by an animal, and a child who hit his head on the corner of a bench. Each issue is addressed in turn, with the whole group discussing and brainstorming solutions on the spot. For example, when discussing the problem with the donkey being fed too much human food, the group derives the solution to improve the signage in the area around the donkey reminding visitors not to feed him. When discussing the issue of the child hitting his head on a bench, the group decides to further investigate whether the Museum can install furniture that has softer or more rounded corners.

In addition to discussing solutions to specific safety incidents, the Safety Committee also performs routine safety walk-throughs using a pre-defined checklist and periodic safety trainings for all staff members. During the observed meeting, committee members specifically discuss an upcoming safety training session that will be led by the local fire department and will focus on ways to evacuate a person in a wheelchair from the second floor of the building in case of a fire. The idea for this training was conceived when "questions [came up] as a result of role playing during an evacuation [drill] of a disabled person on the second floor. They weren't sure of the best ways to get that person down" (Facilities professional).

Interviews with staff members reveal that this is not the only safety training to focus on people with disabilities. Previous safety trainings, for example, addressed concerns around the evacuation of people who are d/Deaf, where staff members ". . . all learned sign language to learn how to say 'emergency, fire, please come with me'" (Programs professional, OEM). Staff members call out the work of the Safety Committee

as an indication that the inclusion of people with disabilities is important to the Museum. For example, one Programs professional reports that she knows inclusion is important to the organization because "when we talk about other things that we're doing in the Museum that is certainly something that tends to come up. So, for example, when we do evacuation drills . . ." Similarly, while an Exhibits professional is discussing how the inclusion of people with disabilities "is a real focus" for the Exhibits Department, she inserts "kind of going off on a tangent—but we have different sorts of drills . . . with people who might not be sighted, or somebody who's in a wheelchair, so that staff gets training on how to work with different populations."

Staff members report that during each evacuation drill, there is at least one person who role plays an individual with a disability. The role play experience can be memorable for the individuals who are assigned this role. One staff member recalls:

> [My] assignment was to be the sister of a person in a wheelchair. [I] remember waiting for the call to go out, and the discussion of the wheelchair and what would happen to the wheelchair . . . [it's] an expensive piece of equipment. (Administration professional, OEM)

Another staff member recounts how she "was in a wheelchair once, but when you put yourself in their shoes by doing that—that was enlightening. When someone comes up in a wheelchair, you remember what it is like" (Exhibits professional, OEM). Through the work of the Safety Committee and its evacuation drills, therefore, it appears that staff members are not only learning about inclusive practices related to safety, but also the experience of living with a disability.

Connections between inclusion in the Safety Committee and other OEM areas. The work of the Safety Committee provides a window into how the work of inclusion is performed at OEM. There are many themes that emerge in the description of the inclusion work of this Committee that connect to the inclusion work in other areas of the organization.

The collaborative nature of the Safety Committee's work connects to the overall collaborative culture of the organization. This culture also seems to permeate all areas where the organization is taking actions to be more inclusive of people with disabilities. When asked to what extent work related to the inclusion of people with disabilities is collaborative or individualistic, most participating professionals respond by stating that the work is collaborative. A professional who works in the Exhibits department states "I think most of my work is collaborative, but especially when we are trying to consider things from an inclusion standpoint." Another professional from the Human Resources area feels that when it comes to the work of inclusion, "I'm a voice among other voices." A Senior Leader of the Museum goes on further and describes the characteristics of this collaborative work and how it contributes to inclusive practices. He states that change toward inclusion "happens through moments of collaboration, coordination, and somebody in that moment having the good sense to ask the question." Another Senior Leader states that he is:

> . . . proud of the fact that we have this staff that's so collaborative that all—at least I hope—all have this attitude toward people with disabilities

that we're here not to single them out and treat them differently than other people who come in.

There are a few staff members who state that their personal work related to the inclusion of people with disabilities tends to be more individualistic than collaborative. Even these individuals, however, state that there are places and times when the work appears to be collaborative. One professional in the Programs area feels ". . . it's collaborative in the Exhibits department. In our department, I'm really the only one that does floor programming, so for me it's much more individual." Another Maintenance professional reports that "when they are minor they are individual. . . . If it's something major . . . it's collaborative."

Beyond being largely collaborative, the Safety Committee's practice of embedding inclusion into its work (addressing, for example, the safety of visitors who are d/Deaf or who are wheelchair users during routine fire drills, rather than hosting separate events about people with disabilities) is also present elsewhere in the organization. This is especially true within the Exhibits department, which is described further below. During interviews, many staff members express the idea that inclusion is embedded in the work, often stating that inclusion has just become a "part of what we do" as an organization. One Facilities professional states that "ADA considerations are always prominent in how we design and build." Another staff member further describes how inclusion is embedded into the thinking of the organization as a whole:

Inclusion is part of how we do business here and that is something that while we are never going to be perfect at, we do really well. It's part of the

> brain system. It's as much a part of how we do business as budgets and what color we are going to paint the walls. . . . It is just as important as how much we charge and what times the trains are running. (Human Resources professional, OEM)

The emphasis on hosting formalized trainings that include discussions related to people with disabilities is also not unique to the Safety Committee and is noted as a practice in other areas of the organization. One Programs professional reports that they have been performing "[universal design] trainings . . . with . . . camp educators . . . in the past few years . . ." Another staff member discusses trainings related to "general customer service" saying:

> Good customer service towards people with disabilities is something that's been covered . . . if you have a missing child and there's an all staff radio call . . . it's . . . important to potentially ask that adult, "Does this child have a disability?" Are we talking about somebody who is coherent about where they are? Or are we talking about a child that might just kind of be wandering around with no good idea of what's happening? And so that's something that was good for me, personally, because it was something I'd never thought about. . . . And since we had that particular training where that subject got brought up, we actually have had a radio call since then with a missing child, that the child had Autism. So it was helpful to know when you're out searching for that child. (Animal Care professional, OEM)

The connection the Safety Committee makes between safety and service to visitors and the inclusion of people with disabilities is also not unique. During their interviews, many staff members implicitly and explicitly discuss the ways in which they connect the work of the inclusion of people with disabilities to the overall organizational culture of safety and service. While it is hard to determine what is the cause and what is the effect (is it the Safety Committee's work that helps staff members to make the connection, or is it an organizational way of thinking that fosters the Safety Committee to make the connection?), what is obvious is that the connection is made beyond just the work that the Safety Committee performs. One professional from Human Resources shares that ". . . all of our staff are trained on our ideals of customer service, which are very inclusive." A Visitor Services professional states that having a "service based environment . . . seems to really promote an equity of all people." Another professional from Visitor Services further elaborates, expressing the following:

> Part of our mission is that we want people to see science as a way of knowing about themselves, their community, and their world. So we want people to come here and feel safe. To explore. To try things. To ask for help if they want or need it. So I think a lot of our core value is to just be a comfortable place. Be . . . I don't want to say accessible because that's kinda the point. But just a place for people. . . . It's not a "don't touch." It's not a "don't ask." It's "we're here to help you." We want to be welcoming.

There are two further aspects of the work of the Safety Committee related to inclusion that resonate with that of the Exhibits department. One is related to the visibility of the inclusion work of the Safety Committee and the potential role it might play in communicating a sense of organizational value. As part of the work of the Exhibits department, there are other projects and initiatives related to inclusion that similarly have organization-wide visibility. Another aspect is the process of reflection, where the Safety Committee is continually reflecting upon and learning from its previous work. This connects to the on-going learning process of Exhibits, which features attention to inclusion over time in large projects and experimentation. Both of these aspects are discussed in more detail below.

In summation, the inclusion work of the Safety Committee has many parallels to the ways in which the work of inclusion is addressed in other areas of the organization. Similar to the Safety Committee, other areas of the organization also embed the work of inclusion into their overall work plan and engage in this work as a part of a collaborative enterprise. Other areas also host formal trainings for staff members that address inclusion, employ a process of learning from practice, and engage in actions that make their work related to inclusion visible to the organization as a whole. The connections that are made by the Safety Committee between its work and the work of inclusion is not unique to the Safety Committee—multiple areas of the organization see the work of inclusion as being directly connected to the core values of the organization—safety and service.

The work of the Safety Committee as described above only portrays a snapshot of the work of inclusion for a particular part of the organization at a particular point in time.

It does not provide an understanding of a longer term view of change. The next lens, the Exhibits department, affords such a view.

Viewing Inclusion through the Lens of the Exhibits Department

The lens of the Exhibits department affords a unique vantage point for viewing changes toward the inclusion of people with disabilities over time at OEM. Multiple participating staff members from the Exhibits department report having worked at the Museum for 15 years or more, which provides the opportunity to hear a longitudinal view of change directly from the people who participated in the effort. In addition, similar to other museums, the exhibitions present on this Museum's campus are changed or remodeled on a relatively infrequent basis, thus providing insights into particular design strategies that were employed at different points in time. Currently viewable exhibitions at OEM date back to the 1990's. Combined, these two attributes of the Exhibits department (long-term staff members and long-term exhibitions) enable a longitudinal view of change that cannot be afforded by another area in the Museum.

Another reason to focus on inclusion within the Exhibits department is that there is a sense amongst OEM staff members that the Senior Leader of Exhibits and the rest of the Exhibits department are a major force behind the Museum's efforts to be more inclusive of people with disabilities. During interviews, staff members outside of the Exhibits department report that one of the primary ways they learn about inclusion is by working with the Senior Leader of Exhibits and others within the department. One Maintenance professional states, "I have learned just from listening to our exhibits design people." Another Programs professional remarks how, for the Senior Leader of Exhibits,

inclusion of people with disabilities "always seems to be at the forefront of his mind" and that she learned about inclusion by working with him to design a particular programming space. A professional in Human Resources recalls that her "aha moment" related to inclusion came when she walked around a particular exhibition with a former Exhibit professional who cared deeply about universal design.

It is perhaps not surprising that the Exhibits department is known for its inclusive practices throughout OEM as this department has a long history of making exhibitions accessible to people with disabilities. According to the Senior Leader of Exhibits (who has been with the organization for around 20 years), work in this area had already begun before his arrival:

> When I came here, the Museum already had a record and practice by working with [an exhibit design firm known for its accessible practices]. So that helped situate the work, which was at a pretty good place relative to thinking about some of the issues.

Another staff member from the Exhibits department who prides herself as a museum historian and archivist goes a step further and traces the Museum's actions in this area to the mid 1960's when a nature trail for the blind was created. Regardless of whether the work of inclusion for the exhibits department dates back 20 years or 50 years, it is clear that efforts in this area pre-date all of the professionals who currently work in the Exhibits department.

When the current Senior Leader of the Exhibits department came to work at the Museum in the 1990's, a number of actions were taken to make the exhibits more

accessible to people with disabilities. With funding from local city bonds, substantial changes were made to an existing popular outdoor exhibition to make sure that people who use wheelchairs could easily access this attraction. This funding was also used to support the building of the insect area where Seth currently works, with attention being paid to wheelchair access to this facility as well.

Although OEM Exhibit's department had begun work in this area before the current Senior Leader arrived and he continued to push this work forward upon his arrival, it was OEM's participation in a professional development program run by an industry organization that the Senior Leader of Exhibits and other staff members attribute to a substantial shift in their practices. This program addressed accessibility, and specifically ADA requirements, for exhibitions and visitor services in science museums. Through this program, participating staff members were provided: copies of guidelines for accessible exhibition design; opportunities to work closely with people with disabilities; and an introduction to the concept of universal design.

Although this experience took place over a decade ago, it still has an imprint on the organization's memory. The Senior Leader of Exhibits calls this experience "a cornerstone that touches, still [exhibit staff members] who are here today." Multiple people within the organization refer to this professional development program, even those who did not start working at the Museum until years after it took place. One Senior Leader outside of Exhibits who started working at the Museum more recently states that he thinks this professional development experience was "where it started." Another professional who recently began working in the Exhibits department states that she has a

"notebook" in her office from the professional development program that she frequently uses. For example, she knows "the right page to flip to, to always find the measurements for if a wheelchair is pulling up to an exhibit table and what the reach should be."

After OEM's participation in the industry organization-led professional development program, the next major project that staff members talk about in terms of the history of inclusive practices at OEM is the development of two award-winning outdoor exhibitions, which were funded by both a federal agency and local municipal bonds. According to the Senior Leader of Exhibits, the decision to create these exhibitions was largely driven by participation in the professional development program that was led by the industry organization:

> We were already moving in this direction during the development of the outdoor experience; really fired up to find new ways to implement what we acquired in the accessibility workshop. And so the mantra at the time was no barriers and to be universal in the way we were understanding it then, and there were also emerging thoughts about what that meant and we needed to explore these too.

According to OEM staff members, the development of these outdoors exhibitions corresponded to changes in how the Exhibits department thought about access for people with disabilities from a variety of angles. Within these exhibitions, the inclusive design approach moved beyond a sole focus on wheelchair access and other physical dimensions of accessibility and started to include an emphasis on the creation of rich, multisensory

environments that could be enjoyed by a broad range of visitors. As the Senior Leader of Exhibits states in his interview:

> It is the availability and attention to the senses and the many ways of encountering an experience that I think is suggested there. . . . So, you know, there are audio described labels and tactile, smell, and sound experiences, and it's a pleasant environment within which to share social interaction. There's the opportunity to be comfortable and sit and drop into other states of mind. There's surprise…

He is not the only staff member who notes the shift and change in direction that came with the development of the outdoor exhibitions. Other staff members, including those within and outside the Exhibits department, consider the multisensory, multimodal aspects of these exhibitions to be noteworthy. One Human Resources professional remarks how "an effort was made to diversify how people can engage [with] the exhibits" in the outdoor exhibitions and how they include "sound components and the touching components for people with visual and hearing impairments." Another Exhibits professional similarly comments on the noteworthy "audio" and "tactile" elements of this exhibition and goes on further to describe a particular experience where there "is a tactile board that has different footprints in it and it has audio answers so you can lift the flap and see the answer or press the button and hear the answer." An Animal Care professional goes on further to elaborate:

> I know that . . . with the newer stuff that's outdoors . . . they have incorporated things . . . on the large maps that you can stand at and say

> you are here, and then see where you're gonna go. There's a button . . . you can push that will actually describe for you that . . . map. As well as having buttons at the individual animal exhibits . . . where we have our kiosks that people can read to learn about the animals, that there are buttons that you can push so you can hear it instead of having to read it.

The shift in thinking that occurred with the development of the outdoor exhibitions was more than just a focus on multisensory learning. Staff members also describe a change in the process used to develop the exhibitions, which involved including people with disabilities as advisors and exhibit testers. One Exhibits professional clearly recalls the involvement of these individuals and how they affected what was ultimately developed within the exhibition:

> During the development, as we would come up with prototype(s), we would ask some of our consultants to come out and say: "How can we make this better? What can we do to make an experience that would be valuable to you?" . . . One of the things that our consultants were saying, "We don't have to have exactly the same experience because we can't see, but if we had an experience that was comparable, that would be relevant to us, that would be a comparable experience" . . . I think some of the [zooming] cameras were things that we wanted to do for our low level vision [visitors], and we did that because one of our consultants came out with low level vision and said, " . . . Without this I couldn't have seen the bear. Now I know what the bear looks like." It was too far out for a visitor

> who has impaired vision to see all the way to the back of the exhibit. Camera brought it right up into that screen so she could enlarge it and actually make out what was there.

Lessons learned from working with people with disabilities on the development of these exhibitions are shared with and remembered by current OEM staff members who were not working at the Museum at the time. One Senior Leader at OEM describes how the Senior Leader of Exhibits tells a story of when "they had disabled members of the community serve as advisors on some of our planning for our exhibits in our outdoor areas" and how this experience changed "the way he viewed his job in designing exhibits" and led him to "fully embrace the idea of universal design." Another Exhibits professional provides more detail on the kinds of stories and lessons learned that get passed on related to working with people with disabilities on the outdoor exhibition projects:

> The meeting that [former Exhibit professional and Senior Leader of Exhibits] held, in which they brought in a bunch of advisors for the outdoor exhibit project. They constantly refer back to examples such as, "When [name of disability advisor] was here and was looking at that exhibit, she said this." Anything that an advisor specifically said about those outdoor exhibits, those kinds of lessons get brought back up to think about if we have comparable experiences. Like for the small sailboats, an example of something that was mentioned a lot was adding some kind of tactile coding so you could feel the different shapes. So that idea of having

> a recognizable mark on things is something that has come up at lot since, and I feel like came from that meeting. And we're about to start redesigning a beehive exhibit, and one thing that has been brought up is when the accessibility advisors were here they mentioned how by touching the beehive you can really feel the vibrations and the warmth of it, and to try to preserve that experience. And so that keeps getting referred to even though that happened years . . . ago.

Staff members also report that when the outdoor exhibitions opened, efforts were made to inform museum professionals within and outside OEM about the accessibility features of these exhibitions. "When each of the new spaces opened we did some trainings about the space," one Programs professional reports. A staff member from Human Resources confirms this notion by similarly stating ". . . when we opened our outdoor exhibits, we were trained on everything." The opening of these exhibitions also led OEM to host a workshop for other science museums across the nation on the universal design of museum exhibitions.

Exhibit professionals recall that it was during the development of the outdoor exhibitions that they first began to realize that designing for people with disabilities improves the experiences for people without disabilities. This concept, staff members report, has since become a regular part of how they think about this work:

> The first thing that comes to mind is that accessibility benefits everybody. . . . Our experience has been . . . if we make an exhibit that's accessible to children, a lot of times that translates to people with disabilities or vice

versa. So we think about it more as universal design and working with a variety of populations. (Exhibits professional, OEM)

Contrastingly, staff members also report that the development of the outdoor exhibitions taught them that the ideal of "better for everyone" is not always possible. As one Exhibit professional states, "I think we have learned that not everything has to be for everyone . . . [and] that realization . . . is an example of change over time." They learned that sometimes their efforts to make something more inclusive of people with disabilities decreases the overall quality of the experience:

> The [name of outdoor exhibit] is an example of an execution that was adversely affected by our drive to be accessible. Fundamentally—I think always—the experience is the most important thing. That said, after initial prototyping we made a decision to make this exhibit wheelchair accessible. And it felt like the right thing to do, but we just didn't anticipate the impact of making it robust enough to handle the demands of weight and additional loading on the apparatus. . . . In retrospect, I think that it would have been justified to have said, "Well, this is one that we just can't make accessible [to] wheelchairs for these reasons . . ." so it's an interesting failing. The experience has caused me to ask more questions.

The next major inclusion effort of the Exhibits department was an indoor exhibition that focused on math, which was funded by a federal agency and developed in collaboration with the Large Science Museum (LSM) that is also included in this study, as well as other science museums. According to staff members, what made the

development of this exhibition remarkable was the extent to which the inclusion of people with disabilities was thought about in all aspects of the design:

> So one of the things that was really cool about the recent meeting in [city where LSM is located], where we looked at the [math exhibit], was I have never in my years at the science museum field heard so many times the phrase, "This one's really cool if you close your eyes." So there were multiple exhibits where that was expressed as a prompt for a really neat way to do something. Well, how interesting is that? That, in fact, it's better. You like it almost better if you do it with your eyes closed. That to me says that there's thinking going on in that group . . . [that led] to exhibits that were inherently better for folks with vision impairment. (Senior Leader from another area of OEM)

Exhibit professionals who worked on this particular exhibition also report that they learned more about inclusive practices through its development. Here again we see that some of this learning came from working directly with people with disabilities:

> One example was writing the ADL for [math exhibition]. . . . When we had the advisor . . . give feedback and [use] terms like at "three o'clock" and "nine o'clock" and saying that those were really useful terms, that was good to know for me. Just hearing some of her feedback on some of the language to make things as direct as possible was helpful, and hopefully I can take those away as lessons learned in the future. (Exhibits professional, OEM)

The process for developing this exhibition was also a bit different from that of the two outdoor exhibitions as it was a cross-organizational collaborative effort that involved a designated advocate for universal design from another museum. Working with professionals from other museums also influenced how OEM Exhibit professionals thought about the inclusion of people with disabilities:

> When we had our kick-off meeting a little over a year ago now, [a professional from another museum] did a presentation about accessibility and universal design, just to make sure we were all thinking about it and put a bunch of resources up on our project wiki. Then, after we saw all the prototypes in September, [other museum professional] scheduled a phone call with each project team to talk through some of the constraints and possibilities of each exhibit in terms of universal design. Out of that, we came up with some, what I feel like were really good ideas for two of the exhibits in particular, to add some touchable components and some ADLs, which was good because we hadn't really been thinking in that direction yet. (Exhibits professional, OEM)

Somewhere along the way, although it is unclear when, members of the Exhibit department developed the feeling that "accessible design and universal design is really important to us" (Exhibits professional, OEM) and that "because we know we're committed, we have to do it" (Senior Leader of Exhibits, OEM). The sense that inclusion of people with disabilities is a priority for the Exhibits department is expressed by other professionals in the organization as well. One Programs professional states that "Exhibits

is probably the most aware of [inclusion of people with disabilities as] that's just—that's one of their priorities." Another Animal Care professional states that the Exhibits department "thinks about that in terms of any new thing we do" and that inclusion "is in our thought process for how we develop things here."

Although there have been a number of efforts that have pushed forward OEM's thinking about inclusive exhibitions, it is important to note that the process of change has not been a steady or linear climb in an upward direction. In some cases, practices learned and applied to one exhibition have not been applied to the next. For example, while ADL's were a major design feature introduced into the outdoor exhibitions referenced above, they were not integrated into the design and development of subsequent exhibitions, until the math exhibition. Other practices developed for the outdoor exhibitions, such as the inclusion of people with disabilities in the process and overt attention to multisensory learning, were not applied to these in-between exhibitions either. However, some of the practices developed earlier—such as attention to wheelchair access, seating, and graphic readability— were applied to the development of all recent exhibitions.

Discussions with staff members reveal that the discrepancy in the inclusive practices between various recent exhibitions does not reflect an intentional strategy. In fact, most staff members struggle to explain why practices from one exhibition were not applied to another or how they got into "a stall pattern." "Budget scope" or "budget constraint" is a frequent response by Exhibit professionals for why some actions are

taken and not others. To explain this, the Senior Leader of Exhibits describes the following example:

> The [name of exhibit] is a good example. Table clearance and maneuverability within the space is very good, but the tactile experiences can be improved. There were budget constraints at the time and production limitation for producing cost-effective dimensional representations of [certain objects]. So it hasn't happened yet, but it is still on our list of things to do.

He also acknowledges, however, that cost also connects to "priorities" and so cost cannot fully explain why some practices are applied and not others.

Another Exhibits professional defines the problem another way. She talks about how they are struggling with "specialized solutions" such as "Braille" and "audio accessibility." When asked why they struggle with these elements in particular, she states, "It's always just been financial for us."

In addition to certain practices not being applied, there is also the challenge of the slow rate of change for existing exhibitions. There are many exhibitions that were built previous to the two outdoor exhibitions—and some even built prior to the Senior Leader of Exhibit's arrival—that have not yet been changed or modified. The end result is that the inclusiveness of the Museum campus as a whole does not reflect the knowledge and awareness of the Exhibits department. Members of the Exhibits department are aware of this discrepancy and of the need for change in certain areas:

> For example, [one of] our outdoor play area[s] for kids, it is about 20 years old and it is just marginally accessible . . . it's an example of something we totally know we need to improve upon, but we can't do much about until we get more funding. (Exhibits professional, OEM)

What is interesting about the statements above where Exhibit professionals describe areas where they have not taken action is that they emphasize that these actions have not taken place "yet," although they do hope they will be taken in the future. In fact, implicit within the history of the Exhibit department and its actions related to the inclusion of people with disabilities is a sense that inclusion is an on-going process—efforts to improve the Museum for people with disabilities did not begin and end at one particular point in time or with one particular project or initiative. This notion is reinforced by staff members' comments. When asked about the nature of conversations around inclusion within the Exhibits department, one Exhibit professional responds with one simple question, "What can we do to make this better?" The Senior Leader of Exhibits goes on to further elaborate:

> I think when we look at who we are, it's always a moment in time. And we are surrounded by the artifacts of where we are coming from and glimpses of where we're going. . . . So where do I think we are? We're headed in the right direction.

Connections between inclusion in the Exhibits department and other OEM areas. Consistent with the view of inclusion through the three other lenses—that of Rich, Seth, and the Safety Committee—the work of the Exhibits department related to the

inclusion of people with disabilities connects in many ways to the work of other Museum areas. Some of the themes that appear in the history of the work of the Exhibits department—learning from people with disabilities, feeling that inclusion of people with disabilities is a priority for the organization, embedding inclusion in the on-going work of the department, learning through reflection on practice, and seeing the effects of internal professional development programs that reach across the organization—are also apparent in through the views the other lenses provide. Yet there are other themes that emerge for the first time in the description of the work of the Exhibits department that also connect to other areas of the organization.

As described above, the work toward inclusion of the Exhibits department has been an on-going and evolving process, as opposed to a one-time event. Such a pattern appears in other areas of the organization as well. Staff members' recognition of change as an on-going process is evident in how they describe their efforts toward inclusion as being "in progress." As one Visitor Services professional states, "I think that we work very hard to be inclusive, and where we can't, it's not for lack of trying, it is for lack of not knowing how to do it yet."

This idea of inclusion as an on-going process of change is present in how staff members respond to issues that the study participants with disabilities raise as they walk through the Museum.[7] After observing that a computer kiosk is inaccessible to a wheelchair user because of the placement of outdoor umbrella stands, staff members inform maintenance of the situation and put a policy in place to avoid this error in the

[7] Staff members at all three Museums were offered the opportunity to walk around their museums with the participants with disabilities; OEM's staff members were the only ones who took advantage of that offer.

future. During another observation, a staff member learns that the cafeteria does not offer food options for people with certain food allergies and intolerances. Based on this information, she adds a specification to the request for proposals (RFP) for the new cafeteria contract that the menu must attend to food allergies and intolerances.

The description of change over time in regards to the work of inclusion of the Exhibits department suggests that on-going change is not linear, but rather punctuated at different points in time through large, well-funded projects. There is also some evidence that change occurs during large projects or events affiliated with other areas of the organization as well. For example, it is the remodeling of the cafeteria and expiration of an existing food service contract that enables the staff member described above to change the existing contract to be attentive to food allergies and intolerances. Another example is that conversations concerning changes to the operation of shipping and receiving include discussions about potentially hiring volunteers with disabilities:

> We are moving . . . shipping and receiving . . . across the street. . . . And part of what we'll be needing for that is a volunteer base for some sort of staff to receive the shipments. . . . This allows us to be able to use and include mentally handicapped adults as well in that . . . I think it's something that we've wanted to do for some time. (Visitor Services professional, OEM)

Another similarity between the narrative of the Exhibits department and that of other areas of the organization is the role that inter-organizational collaborations play in facilitating change and learning. For example, the Animal Care department has been

partnering with local vocational programs for 10 years as part of its volunteer effort that includes people with disabilities, and staff members from the Programs area previously partnered with a local university to create a "training for children with autism" for their department. Observations of a staff meeting show other members of the Programs area meeting with a large, national organization for people with disabilities to discuss a potential new collaboration.

A common sentiment that is shared between the Exhibits department and other areas of the organization is the notion that designing for people with disabilities improves the experience "for everybody." Staff members in a range of organizational areas recognize that many of the Museum's inclusive practices benefit more than one audience type. Sometimes they express this idea using broad phrasing such as "accessibility improves the experience for everybody" (Senior Leader, OEM). Other times they discuss the usefulness or attractiveness of specific design features for multiple audiences—including visitors who do and do not have disabilities:

> In the bird exhibit . . . they had statistics that you could do by visually counting the birds and I believe they had different statistics that you could do by listening to the birds and the different sounds they were making. . . . It's a good activity, whether you're visually impaired or not . . . (Programs professional, OEM)

Staff members also connect this idea— that features or actions intended to help people with disabilities also helps other audiences—to areas beyond exhibitions. For example, Program staff members routinely ask all parents if their child has specific needs

or interests that should be attended to during the implementation of their sign-up for courses and camps programs. Staff members from this area report that this practice benefits all children, not just those with disabilities. Similarly, Visitor Services staff members feel their practices (such as providing golf carts or wheelchairs free of charge) help not only visitors who self-identify as having a disability but also older adults. The notion that there is a limit to this idea—that sometimes designs for people with disabilities are not better for all—appears to be isolated within the thinking of the Exhibits department as professionals from other areas others do not discuss this idea in their interviews.

Another idea that is shared across the Exhibits department and other areas of the Museum is the feeling that the cost of inclusive practices or existing budget limitations can impede OEM from taking all of the actions it could to make the Museum inclusive of people with disabilities.

> I think with everything, you know, it comes down to time and resources. I wish . . . every program and every exhibit could accommodate every person and I know that's not possible. (Programs professional, OEM)

Similar to statements made by Exhibits professionals, other professionals within OEM recognize that "budget" does not explain the full story. Another Senior Leader within the Museum states that perhaps it is the way that budgets are created that needs to change, "The other issue [is] that we . . . don't build programs with the same kinds of budgets that we have for exhibits. . . . We don't budget for [certain inclusive practices]."

In summary, change toward the inclusion of people with disabilities is an on-going and evolving process at OEM, and staff members feel that their efforts are still "in progress." The change is not a linear climb, but rather features punctuated periods of time where greater efforts are taken. The change is not consistent either, with some situations where practices learned from one project are not applied to the next. A number of processes appear to facilitate the change, each of which is present in other areas of the organization (some of which appear in through the other lenses as well): professional development programs, large and well-funded projects, collaborations, and working with people with disabilities. Through such processes and work, staff members have come to understand that inclusion is a priority for the organization and that designing for people with disabilities improves the experience for everyone. While these notions are shared with the broader organization, a notion that is more isolated within the thinking of Exhibits is that there is a limit to the "better for everyone" idea and that sometimes designs for people with disabilities do not improve the experience for all.

It is still unclear what holds the Exhibits department back from being more consistent in their practices. While many state it is a concern for budget, others acknowledge that the problem is one of prioritization or how one forms the budget at the beginning.

What sets the Exhibits Department apart from other areas in the organization is that staff members from multiple report that they learn about inclusive practices from those who work in the Exhibits department. In some ways, this makes the Exhibits department a focal point of the Museum's efforts to be more inclusive.

Viewing Inclusion of People with Disabilities across the Lenses at OEM

Viewing practices related to the inclusion of people with disabilities at OEM across all four lenses provides a holistic view of what the change toward inclusion looks like at this medium, suburban museum with a large outdoor campus. These lenses afford the ability to identify areas where changes in inclusive practices have and have not taken place within the organization, which in turn helps to identify the kinds of processes and contexts that facilitate, detract, or impede changes toward the inclusion of people with disabilities.

Looking across the four lenses reveals that change has occurred and is occurring in this Museum as the organization learns and adopts new inclusive practices over time. OEM regularly attends to the needs of people with disabilities through its physical designs. The campus and facilities include wide, open, and level pathways; seating; ramps; accessible parking spaces; and automatic doors. The exhibitions demonstrate attention to measurements and other physical dimensions, a use of multisensory interactives and multimodal interpretation (audio and text), and technologies designed to be accessible to people with disabilities.

Beyond designs, OEM also offers a number of services and programs that are inclusive of people with disabilities. In the lobby, there are wheelchairs, strollers, and golf cart rides that visitors can request. The Museum also has an explicit policy and procedure for service animals on campus, has trained staff members to be available to help, and has plans for a cafeteria that will attend to food allergies and intolerances. Programmatically, there is one effort that specifically focuses on safety, and there are

also educational programs that offer opportunities for multisensory learning and specifically ask all parents about needed accommodations.

The lenses of the Safety Committee as well as the Exhibits department yield insights on the process of change that led to the actions cited above. Across both of these areas (which are two areas within the organization where some of the more significant changes are taking place), staff members report that they see the change toward the inclusion of people with disabilities as being an on-going process. For the Safety Committee, change takes place through a continual process of on-going reflection where staff members reflect upon, learn from, and then build upon their prior actions. In the Exhibits department and other areas, the change is more episodic and less linear or consistent over time, with punctuated periods of greater change that correspond with large, well-funded projects. Learning from people with disabilities and external collaborations also plays a greater role in the change process of Exhibits as compared to the Safety Committee. The learning-through-practice that takes place in each of these areas is enabled in many ways by the fact that the work of inclusion is embedded within everyday work.

One of the key similarities between the Exhibits department and the Safety Committee is the role they play in the change process of other areas of the organization. Staff members report that both of these areas have helped them to learn more about inclusive practices over time, with the organization-wide professional development programs in particular playing a critical role in that learning. In addition, staff members

from the Exhibits department are seen as a key way that professionals from other areas of the organization learn about inclusive practices.

There are also a number of behind-the-scenes inclusive practices that the Museum routinely employs. As Seth's experiences demonstrate people with disabilities are regularly involved in the work of the Museum. In addition, the lenses of the Safety Committee and the Exhibits Department shows that the Museum offers occasional professional development experiences for its staff members, interns, and volunteers that address the topic of inclusion. It is important to note that these behind-the-scenes practices align with the processes cited above that promote on-going change toward greater inclusion of people with disabilities. In this way, these practices are both actions taken by the organization to be more inclusive and are also the way that the organization learns to be more inclusive.

There are other areas, however, where there are inconsistencies in the practices employed, which suggests that the change has not become integrated into all areas of the organization's everyday practices. The description of Seth's experience (and others with disabilities involved in the work) reveals that not all OEM staff members share the same understanding of how people with disabilities can contribute to the work of the museum. The lens of the Exhibits department further details how practices developed to make one exhibition inclusive of people with disabilities are not always applied to the development of future ones.

The reasons for these inconsistencies are unclear. While many cite a lack of funds, others acknowledge that perceptions of insufficient funding reflect the

organization's priorities or the lack of attention to inclusive practices when planning the budget in the first place. Another perspective is offered by one staff member who suggests that the lack of action reflects something that the organization just hasn't learned how to do yet. This suggestion may have merit, for insufficiencies in current practices revealed through the experiences of the study participants with disabilities are quickly remedied and addressed by OEM staff members.

Beyond changes in practice, there are also changes in how staff members have come to view inclusive practices over time. The lenses of both the Exhibits department and the Safety Committee make apparent that staff members see the inclusion of people with disabilities as an organizational priority. This feeling stems in large part from the visibility given to the work of inclusion through both the all-staff trainings offered by the Safety Committee and the focus on inclusion in large-scale projects. Furthermore, the lens of the Exhibits department reveals that many staff members across the organization have developed the perception that designing experiences for people with disabilities improves the experience for everyone. Only within the Exhibits Department, however, have staff members come to see that there are limits to this idea.

There are also connections that are made between the culture of the organization and the work of inclusion. The lenses of both the Exhibits department and the Safety Committee highlight how OEM's inclusion work is a collaborative endeavor, as is all work at this Museum. The idea of inclusion is also strongly linked to safety and customer service—two values that are very important to OEM professionals.

This case description provides a window into understanding how one museum operating in a particular context, the Outdoor and Explore Museum, has taken actions to be more inclusive of people with disabilities. This organization has a relatively small staff and budget, and is located in a suburban environment. What does inclusion look like in a large museum? How about in a museum located in an urban area in a large city? Descriptions of inclusion in such contexts are provided in the next two case descriptions.

Chapter 5: Large Science Museum (LSM)

This case description depicts the work toward inclusion of the largest of the three museums studied, the Large Science Museum (LSM). The case begins with a sketch of the overall context. It then continues to discuss the inclusion of people with disabilities at LSM by looking through a variety of lenses, including the reactions of visitors with disabilities who frequently attend the Museum; the experience of a consultant with a disability who works with the Museum; the current work and discussions related to inclusion of a particular programmatic area (Courses and Camps) of the Museum; and a historical and longer-term perspective of inclusive practices within one specific department (Exhibits). The case ends with a summary that looks at the work of inclusion collectively through these four lenses.

Context

LSM is one of the largest science museums in the world and one of the most established science museums in the United States. LSM attracts over 750,000 visitors a year and has an operating budget of close to $40 million according to a recent annual report. LSM also employs over 250 full-time staff members, over 450 part-time staff members, and over 600 volunteers according to written correspondence with a member of the LSM Human Resources department. LSM currently occupies a building with more than 350,000 square foot building that was built after the enactment of the Americans with Disabilities Act.

Not only is this institution large in terms of its size, it's also expansive in terms of its educational offering. Within the Museum, visitors can experience exhibitions that

feature both object-based learning (through its natural history and history of science collections) and interactive, hands-on learning. In addition, it hosts an extensive suite of in-museum programs, including summer courses, collections-based programs, stage or theater-based shows, on-the-floor interpretation carts and activity areas, amongst others. The reach of LSM's educational offerings extends far-beyond its walls; each year, millions of people around the globe experience LSM's educational offerings through the dissemination of its exhibitions, programs, and films.

Consistent with what might be expected for an organization whose activities and connections are so expansive, LSM is funded through a variety of sources. Funding for the Museum's activities come from the state government (a small proportion), federal grants, corporations, foundations, and contracts with other museums. The most significant portion of its funding, however, is derived from visitor-generated revenue such as admissions and ancillary expenses (including the gift shop and cafeteria).

Given its large size, it is perhaps not surprising that LSM staff members report feeling that the Museum is "siloed," which they feel has its pros and cons:

> We are a sectional organization . . . when you're compartmentalized, it's pros and . . . cons. The pros are that they . . . do their job and it's fine. The cons are that if you want them to work with someone else, you kind of have to force them sometimes and they don't want to, it creates friction. (Facilities professional, LSM)

To address this problem, LSM recently underwent an expansive reorganization, and staff members are adapting to this change[8]:

> And in this new structure we have . . . we're coming into contact with folks . . . in a way that we did not work together before. . . . There is some tension in becoming familiar and learning the perspectives of different folks who do different kinds of work. (Exhibits professional, LSM)

Although internal collaboration can be strained at times, LSM is highly collaborative when it comes to working with external organizations. It partners extensively with other museums across the United States and around the world to develop new exhibitions, programs, and films. It also has a close partnership with the state's education department, and has active partnerships with local universities and community organizations. The focus on collaboration is evident in statements from a recent annual report, where the President focuses on "links" and connections between the Museum and other organizations, and how these linkages are essential for their work. This idea is reinforced in the perceptions of other staff members as well:

> I am amazed at the connections people here have with other museums. We have many grants where we are collaborating on other museums . . . many of our federal grants are collaborative. We benefit from [an amendment] that was recently added to the state constitution, where money from sales taxes provided to outdoors and cultural and arts organizations and we've

[8] Given the reorganization, many staff members were changing their roles and responsibilities while the study was taking place. For the purposes of this study, the assigned role attribution of the staff members as seen in the text best reflects the perspective that they brought to the discussion. In some cases, the professional was no longer in that role by the time of the last site visit.

> collaborated with the [local history museum] . . . I know that [Senior Leader of Exhibits] . . . has been to a number of museums around the country and outside the country to talk about how we could work together. So it's rather amazing how collaborative we are. (Programs professional, LSM)

LSM tends to be externally focused on its audience as well. Attention is paid to the kinds of activities that will attract a large audience to its site, with a particular focus on temporary exhibitions as a mechanism for doing so.

> The largest part our operating support comes from our gate. Visitors are probably the biggest [stakeholder], so we want to be relevant and something they want to come and see. If we're not, we suffer. (Exhibits professional, LSM)

The institution also has a clearly articulated notion of who its audience is. Substantial data exists about the Museum's visitors, whom are generally described by the staff members as consisting of families, school groups, adults, youth or other children, and schools. The Museum contains a Visitor Research and Evaluation department that continually gathers information about the audience, including how they learn, motivations for visitation, what their preferences are, and the best ways to design the educational offerings to optimize the experience for the audience.

LSM demonstrates a long-standing and widespread commitment to issues related to social justice and education. The organization has a specific department that focuses on engaging the community and there is also an informal group of individuals who are

currently crafting a new vision statement for how the Museum will address issues of social justice through its educational activities. The Museum tends to have a broad definition of what it means to engage the community:

> When we think about community engagement here it is not limited to people of color or people who have limited economic means, but more broadly thinking about making this content relevant to as many people as possible and trying to connect the Museum and the Museum experience to people who may not have museum going as a part of their realm of experience. (Programs professional, LSM)

Despite such efforts, some staff members are concerned that the Museum attracts a largely affluent and white population:

> We have some surprises in our community . . . I don't know of any district that hasn't had an increase of students of color . . . of less than 200 percent since about 1990 and some are 3 or 400 percent, some are 700 percent, some are 1200 percent increases of students of color. So our community is really changing and our museum needs to keep up with that change. (Programs professional, LSM)

To address such concerns, the Museum has taken a number of actions to reach out to the various local communities, including involving traditionally underrepresented audiences in the development of new exhibitions and integrating content about existing societal disparities into new exhibitions. A few attempts have also been made to create

bilingual programs and exhibitions. LSM also offers reduced-cost admissions and a memberships program to individuals who have a limited or fixed income.

Understanding the context of LSM—a large museum that has regional, national, and international collaborations and impact; an environment that fosters a culture that supports social justice; and a workplace that recently underwent an organizational change aimed at solving communication problems—provides a backdrop for understanding the work and change toward the inclusion of people with disabilities at this museum. To gain further insights on this organization and its change toward inclusion, a variety of lenses are used to look at the organization from different vantage points.

Viewing Inclusion through the Lens of Fred's and Holly's Experiences Visiting LSM

Holly and Fred are married and have been together for close to 20 years. These frequent visitors attend LSM a few times a year (often with their grandchildren) and have been museum members for about four years. Fred currently lives on medical assistance, which entitles the couple to a discount on their membership through the Museum's financial assistance program. Holly and Fred are both retired. He used to be a disk jockey and she was a medical transcriptionist.

Holly and Fred both use electric wheelchairs. They used to be in scooters, but now they are in electric chairs because "these things turn on a dime." Holly began using a chair about a year ago, and Fred started using his chair after a recent heart attack. Fred has diabetes and has undergone a number of muscular-skeletal surgeries. Holly has heart disease and uses an oxygen tank to breath. Although they are relatively new to their

chairs, they are quite comfortable in them. Fred has taken the time to customize each chair, building and adding devices such as cup holders, mirrors, and reflectors.

Shortly after Holly and Fred arrive, they express frustration with the parking at LSM. Usually, Holly and Fred park at a meter on the street when they visit. Today, metered spaces are not available, so they parked in the garage, which presents some challenges for them:

> Fred: We couldn't park in a handicap spot and where we parked we had to get [the wheelchairs] out of the back of the van and cross two [lanes] and there was no walkway or anything. . . . And where we parked, the cars can come right around the corner and another corner right away.
>
> Holly: The ramp is not well designed for cars period! Let alone handicapped.
>
> Fred: Or a full-sized van like ours.

After discussing the problems with the parking garage, the focused observation begins in a local river exhibition that has not been remodeled for some time[9]. The first interactive they visit is one where there is a large, changeable picture. Fred rolls up to the interactive and turns the handle that changes the picture with ease. From there they go into a real boat that has been placed inside the river exhibition. Both Holly and Fred very easily go up the ramp that connects the gallery floor with the floor of the boat. Once inside, they are able to turn around easily, even though the inside of the boat is relatively narrow.

[9] This exhibition was remodeled after Fred and Holly visited the Museum. Many of the accessibility concerns Fred and Holly raised during their visit were corrected in the exhibit remodeling.

When in the boat, Fred and Holly both notice that there are stairs that lead to the second deck. They disagree about whether this is a problem. Holly's perspective is that the boat is a real artifact and can't be changed so it is unreasonable to expect that they could have access to the second deck. Fred says he would like to know at least what is at the top of the stairs. Holly and Fred also disagree about the level of the windows in the boat, which cannot be viewed from the seat of a wheelchair. Fred says he would prefer it if at least there was one window that he could look out of. Holly feels that the windows are a part of the experience as they tell you how high the windows are in a real boat of this kind.

Holly and Fred leave the boat and head back down the ramp. As they do, the ramp moves a bit. They both mention that the end of the ramp is a little steep, especially the lip. Holly tries to go outside to view the top of the boat. She presses the button to open the electric door, but it won't budge. The motor is running but the door is not opening. Fred goes over to the door and tries to pull it open—that's when they find out it is locked. Holly wonders if the Museum could put a sign up to tell people this is so, as this would prevent the motor from wearing out and avoid a situation where the door is not working when people really need it.

They continue on with the rest of the river exhibition. As they move through this gallery, they do so with ease, using the different interactive components. They have no problems reaching the controls of the computer interactive, they are also able to easily roll over the puzzle pieces that are on the floor, move the light-weight stools out of their way that are in front of certain activities, and easily turn a crank at an interactive exhibit

component about aquifers. As Fred navigates through the gallery he makes connections between the content of the exhibition and his life experiences on the river. He eventually says, “See, a lot of this stuff brings back a lot of memories for me!”

After some time, Fred and Holly find an interactive that both intrigues them and is hard to use—it is an interactive about the extent to which certain rocks in the river will absorb water. Fred starts engaging with this interactive first and says, “It’s hard to believe that rocks really absorb water.” He moves the faucet back and forth over two or three of the six rocks that are part of this interactive. He calls Holly over and she looks at it. They try to find a way to reach the last three rocks, but this is quite difficult as the component is pressed up against a wall and they are not able to get to the other side where the last three rocks are. Despite these complications, they keep persisting as they are interested in the content and really want to use the interactive. After using it, Holly states that all that needs to happen is that the rock exhibit component needs to be moved to the left and the case next to it needs to be moved to the right and then there would be sufficient room for them to reach the rest of the rocks while sitting in their chairs.

As they keep moving through the gallery, Fred and Holly notice that a few of the older cases are not designed as optimally as they could be. The seams of the cases are directly at eye level for them, and so they cannot really see into the case to read the label. They are interested in the content, so they keep moving their heads in different positions, but it doesn’t really work. Fred says that there seems to be a bifocal effect; when he looks at the case from one angle it almost appears magnified. It would be better if there was curved Plexiglas rather than a seam. They also see a newer case that they feel is “perfect”

as it is placed at a height that makes it easy for them to view the objects, and the seams do not obscure their view of the labels.

After viewing the river exhibition, they head to the elevator and go down a floor. As they leave the elevator, they notice a "No Food or Drink" sign that is placed in prominent view. Fred comments that this policy can be a problem for them as Holly needs to keep hydrated given that she is on oxygen, which is very drying. He is also diabetic. Even though they know the Museum's policy is that you are not allowed to bring in food or drink, they bring in water in a capped bottle anyway and keep that water in their cup holders.

Holly and Fred next enter one of the newest exhibitions in the building, which focuses on child development. There is a case in this gallery that has a series of labels and objects that connects to the content. The objects and the labels are all placed above eye level for anyone in a seated position, and the font of the label is small and thin—as if it is trying to mimic a person's handwriting. Holly strains herself as she tries to view the labels in this case by lifting herself out of her chair with her arms just a bit. Fred remarks that not only are the labels too high, the size of the text on these labels is also really small and in a font that is hard to read.

After trying to read the labels in the case, they go over to another exhibit component where you can try on different glasses and experience what infant eyesight is like at different stages of development. They remark on how newborns seem to be nearly blind and wonder how they can see anything at all. They also state that they like how this

activity has two stations—one high and one low (which can be easily operated from a seated position).

They leave the child development exhibition and head over to a health exhibition. Here Fred points out an interactive that is "totally unusable" for wheelchair users because you have to "step on a plate" in order to see how much blood you have in your body. Meanwhile, Holly tries to use another interactive, and as she does, a child walks directly between her and the interactive, and in the process, steps on her foot. She reprimands him, but he doesn't seem to care and he keeps using the interactive. Holly reports that she "got upset with the young man because he stepped right in front of me, you know, like I wasn't even there. They don't seem to care."

They continue on in the health exhibition, looking up at models of veins and arteries that flow along the ceiling and then down along the walls where visitors can feel the "blood" flowing through the tubes. Holly likes this part and encourages Fred to try it. She likes feeling the differences between the veins and the arteries and remarks on how the tubes are easy for her to reach and feel. She reports, however, that the labels are hard to read because the font is small and they are placed too high on the wall "especially if you wear bifocals."

Fred pulls up to an electrocardiograph interactive. As he reaches forward from his chair to use it, two girls budge in front of him and start using the interactive. Fred responds by saying "This place teaches a lot, but it doesn't teach manners." After the girls leave, Fred uses the interactive and notices that he gets a different reaction—spikes—when the kids come by and make a lot of noise. After using this interactive he

reports, “Now this is a perfect exhibit as far as I’m concerned. Especially when you have to do an interactive thing like this.” He says the controls are easy to reach, and the table is easy to pull under.

Holly goes into a small alcove that contains cross-sectional slices of a real human body. As she goes in, she says “this is fascinating.” Fred says that he tends to be a bit squeamish, so he is very appreciative of the fact that the label outside the area tells you that there are body slices inside because then he knows he can avoid looking at them if he would like. He decides that these are OK to look at and joins Holly inside the alcove.

Fred and Holly then use the microscopes that are located in this area. They remark on the angle of the microscopes, which make them easy to use. Fred says, “If it was flat I doubt I could be able to [mimics looking in] unless they lowered it. If it was any lower though, I’d have trouble [motions pulling up underneath].”

They then move on to an area with a giant hand on the ground. They point out that the labels around the hand are very easy to read and are placed at a position and height that works well for wheelchairs. They especially appreciate the angled labels.

After visiting the exhibitions, Fred and Holly agree to spend additional time being interviewed. They comment on how “that river area, I think that’s laid out just beautifully” with wide open pathways and an expansive view of the local river. On the other hand, certain exhibitions, such as the health area, seem too crowded with individual interactive exhibit components, which means “it’s accessible, but not comfortably so when crowded.” When asked what could be improved, Fred and Holly comment that “the parking ramp is the big thing.” They also think it can be confusing to get around the

Museum and that "There should be something to let people know where the main exit is." Otherwise, Fred and Holly feel, "They're doing a super job overall." The interview ends, and Holly reports that she is a little tired. Regardless, she wants to stop on the way out to renew their membership.

Connections between Fred's and Holly's experiences and other visitors with disabilities. Fred's and Holly's experiences at LSM bare similarities to those of other visitors with disabilities, as well as LSM staff members. Many of the attributes Fred and Holly enjoy and appreciate about the Museum—such as the reduced admission for individuals receiving government assistance, the automatic doors, the easily navigable pathways, the attention to heights and reach for wheelchairs in certain exhibits, the multisensory or hands-on exhibit components, and the multiple locations from which objects can easily be viewed placed in multiple locations for easy viewing—other visitors with disabilities report that they enjoy and appreciate as well. Staff members also state that these attributes represent purposeful actions taken by LSM to make the environment more inclusive of people with disabilities (see Table 8).

There are also other positive features of the Museum that are not mentioned by Fred and Holly, but are mentioned by other visitors with disabilities. One visitor who has two young children (one who is on the autism spectrum) appreciates the accommodations offered through the Museum's Courses and Camps program. A broad range of visitors comment that the presence of comfortable seating throughout the Museum greatly increases their comfort.

Similar to Fred's and Holly's experiences with the accessibility of the Museum's labels (where some labels are well placed with easy to read fonts and others are not), other visitors report inconsistencies in the practices employed throughout the building. For example, while one d/Deaf visitor appreciates the use of captioning in many areas of the Museum, she also notes that some films and a few exhibit components are not captioned. The same is true for audio description as some exhibit components (although admittedly fewer than have captioning) and films provide audio interpretation, while others do not. The use of accompanying tactile cues in exhibit components is also not always consistent. Visitors also feel that some areas of the Museum are cleaner than others, and that some exhibit components offer more digestible content (with fewer long text panels or videos) than others.

Usability of the interactives' design is another area of inconsistency. Visitors with disabilities feel that some exhibits are easy to use while others are difficult. While difficulty with interactive usability can be a common problem in science museums for all visitors, it is especially problematic for the participating visitors with disabilities, who feel that interactives are difficult to use because of their disabilities, not because of poor design.

There are other inconsistencies between visitors' experiences at LSM. For example, although some visitors find LSM staff members to be very helpful, others experience negative interactions with staff members. Wayfinding is also difficult for some (especially the two participating visitors who are blind who feel they cannot navigate the Museum on their own), but easier for others. There are also variations in

terms of people's reactions to the presence of food and drink within the Museum. Some visitors appreciate the fact that there are multiple cafes in the Museum (including one in the exhibition gallery area) and feel the Museum gives them plenty of access to food and drink throughout their visit. For others, like Fred and Holly, however, the current amenities are not sufficient as they also need consistent and ready access to drinks wherever they are in the building.

There are also areas where there are inconsistencies in perceptions between the participating staff members and the visitors with disabilities. One of these areas is parking, with staff members reporting that the Museum has accessible parking, but visitors with disabilities feeling that the parking at the Museum is not safe or adequate for their needs. Another area is American Sign Language interpretation services. One frequent visitor who is d/Deaf reports that she was previously not aware that she could request interpretation services, and instead often brought her hearing son with her to the Museum to serve as her interpreter. According to staff members, however, visitors who are d/Deaf can call in advance and request an interpreter. One final area is the inclusiveness of the Museum's drop-in programs. While staff members state that accessibility has been attended to in these programs, the experiences of visitors with disabilities show that certain programs are hard for visitors to access due to lack of wheelchair access or descriptive language for visitors who are blind.

Conversely, the other areas where there are inconsistencies between the participating staff and visitors' perceptions are ones where visitors think the Museum is doing an excellent job, and staff members feel there is a need for improvement. One such

area is lighting, with staff members feeling more attention needs to be paid to this aspect of the Museum's design, and visitors reporting that the Museum is well lit. Another area is the extent to which the Museum's exhibition design is inclusive of visitors with cognitive, intellectual, or learning disabilities. While staff members feel there is a need for improvement, both of the participating mothers who have children with intellectual disabilities (one is the mother of an adult child with severe cognitive disabilities and another is the mother of a daughter who is on the autism spectrum) feel the Museum is well designed for their children and enables them to learn. An observation of the daughter who has autism confirms this, as this girl thoroughly engages with the exhibitions and self-reports learning from the exhibit components as she uses them.

One final area of inconsistency are those actions taken to make the Museum more inclusive of people with disabilities that are mentioned by staff members, but not mentioned at all by the participating visitors with disabilities. There are multiple reasons why this may be so. One is that there are some actions the Museum takes that are not particularly relevant to the small group of visitors participating in the study. For example, the Museum offers free wheelchairs for use in the entire Museum and a variety of assistive listening devices for use in their film theater, but none of the study participants need such services. Another reason for the difference may be that the participating visitors do not experience certain areas of the Museum's operations where actions are being taken, such as the theater programs that make accommodations for people with disabilities or the teacher professional development programs where connections are made to special education. Given the number of offerings at LSM, it is understandable

that not every visitor would experience every aspect of the organization's inclusive practices during a visit. Another reason for the difference between what staff members and visitors report may be that some of the Museum's actions take place behind-the-scenes and are, therefore, invisible to visitors with disabilities, such as staff trainings and the involvement of people with disabilities in the Museum's work. There are also other practices that may go unnoticed by people with disabilities, unless such practices or services are missing. These include elevators (which LSM purposefully included multiple of in their new building for people in wheelchairs) and having a defined service animal policy.

There are places where a broad range of the visitors experience difficulties during their visit that are similar to those experienced by Fred and Holly. These include the high level of background noise, crowding, and rude behaviors by other visitors toward people with disabilities. There are additional inaccessible attributes that other visitors mention that are not part of Fred's and Holly's experiences, including the absence of visitor service information in multiple formats (audio, large print, Braille, and dynamic text for announcements), inaccessible sidewalks and crosswalks surrounding (but not owned by) the Museum, and the lack of clear sight lines in exhibitions that negatively affect the ability of parents to easily monitor their children (especially those prone to wandering). Staff members only mention some of these inaccessible attributes of the Museum (wayfinding for visitors who are blind, background noise, rude visitors, and inaccessible sidewalks and crosswalks).

There are a few inaccessible areas that are mentioned by the participating staff members, but not the participating visitors. One action that staff members feel needs to be taken, but visitors do not comment upon is enhancing communication with visitors about the accessibility accommodations, services, or features the Museum offers. It could be that visitors do not know what is *not* being communicated to them. The other two areas where staff members feel further actions are needed are internally focused: the need for a designated staff member to focus on accessibility, and better information sharing between staff members. It is not surprising, therefore, that visitors did not mention the need for these actions.

While the above discussion connects largely to the presence or absence of certain accessibility features, it is important to note that this is not the only aspect of the Museum experience that matters for the participating visitors with disabilities. Similar to Fred and Holly, accessibility is only one aspect of the Museum experience that adult visitors with disabilities care about when describing what they value about LSM. Just like Fred, who connects to the content of the gallery about the local river, other visitors report being moved, excited, or engaged by particular content or experiences they come across during their visits. This is exemplified in the enthusiasm a father and his adult daughter have for the museum. Both members of this family have mobility related disabilities, and together they describe LSM as the site of "some of the better memories for our family" and their visits as "wonderful."

Overall, Fred's and Holly's experiences provide descriptive insight from the visitor perspective about the actions taken or not taken by LSM to make the Museum

experience more inclusive of visitors with disabilities. This description, however, only tells part of the story and does not address what the experience is like for the volunteers and staff members who work for LSM. To learn more about this aspect of the organization's inclusion, the lens of Oscar's experience can offer some illumination.

Table 8

Actions Taken/Not Taken to Make LSM More Inclusive of People with Disabilities

Actions Taken	Inconsistent Actions	Actions Not Taken
• Financial assistance	• Helpful staff members	• Background noise
• Automatic doors	• Captioning	• Crowding
• Navigable pathways	• Audio description	• Rude visitors
• Attention to measurements	• Wayfinding	• Wayfinding for visitors who are blind
• Multisensory exhibits	• Cleanliness	
• Object visibility	• Tactile cues in exhibits	
• Lighting	• Digestible content	• Visitor services communication in multiple modalities
• Accommodations for classes	• Usability	
• Ample seating	• Food and drink policy	• Parents ability to monitor children
• Free wheelchairs	• Parking	
• Assistive listening devices	• Attention to intellectual disabilities	• Museum surroundings
• Connections to special ed.		
• Modified theater programs	• Interpretive images	• Informing staff and visitors about accessibility
• Staff trainings	• Large/ high contrast label fonts	
• Involving people with disabilities in work	• ASL interpretation	
	• Individuals/ groups responsible for accessibility	
• Service animal policy		
• Multiple elevators	• Accessible drop-in programs	

Viewing Inclusion through the Lens of Oscar's Experience as a Consultant

Oscar has been working with LSM for over five years, serving as a paid consultant. In his own words, he "tend[s] to work with mostly the exhibit development . . . and also lately with . . . visitor research and evaluation." This is the only museum where he consults on a regular basis. For Oscar, this is occasional work that supplements income from his full-time job at a local non-profit, which focuses on the inclusion of people with disabilities in other settings. Oscar's also actively involved in a variety of locally-based disability community organizations, and although he is blind, he does not like to define himself primarily in terms of his disability:

> When I do my talks, that's how I always introduce myself. I start out and say, "I'm Oscar. I'm married. I have a dog. I have a grandson. I work doing this. I'm an individual who's blind. I like to go for hikes. I collect music." . . . After I'll say, did you notice that was in the middle? . . . It doesn't define me; it's just a piece of who I am.

Oscar's involvement with LSM began when the Museum's building was being constructed, and he was a member of a local council for people with disabilities that had been asked to provide feedback on the accessibility of the building and its adherence to the Americans with Disabilities Act (ADA). Oscar views this as an indication that "upfront, right away, [LSM] wanted to make sure that they were accessible." Due in part to his involvement with the council and LSM during its early days of construction, Oscar was later contacted to serve as a consultant for a new exhibition where visitors who are blind or have low vision were considered a primary target audience. According to Oscar,

> From the moment I started working there with [name of an exhibit developer] and all of his people in his department . . . , I felt that the commitment on their part was 100 percent. I mean the whole exhibit was being built very strongly on the premise of wanting to make it more accessible for people who had low vision or were blind or have other disabilities too, but we were focusing on that to start. So that was right up front from when I met [exhibit developer] and [he] was very much behind it, the whole department was behind it. I had the feel that the Museum was with it.

Oscar's involvement with LSM did not stop after that exhibition was completed:

> After doing [name of exhibition], . . . I've written several letters and been involved with several proposals for grant money, and it's put right in the grant that this is a piece that we are including into the whole process, into the whole development. So when they do get the money, which is really tough these days I understand, I'm right there— the consulting, the whole process is right there. . . . That to me . . . is a really positive step. I think that says a lot, when you are looking to become more inclusive and develop a museum that is more accessible, to put it in right at the very beginning.

Oscar feels he has contributed significantly to the Museum's work. He works closely with many in the Exhibits department, and feels that they not only solicit his opinion, but act upon it:

> I think that with the staff that I've worked [with], there has been a real sense that they want to do this, they're interested in it, they get excited about it. It's been so much fun because there's been times when I've brought up ideas or suggestions and you can just hear their wheels turning of like, "Oh this is exciting, I've got to go investigate this, I've gotta go do this." . . . What I feel here is this is just not a burden to them. . . . They want to do it. . . . So what I see around here, from the staff is just a real wanting to and eagerness to be more inclusive.

Staff members also note, however, that part of what makes it easy to work with Oscar is that there is a lot of back and forth discussion, and Oscar is not insistent that every exhibit component needs to fully accessible to every visitor:

> Oscar doesn't expect everything to be perfect for him, he doesn't. And then sometimes he'll say, "Yeah, that's just never gonna work for me." And then it's our responsibility to say, "Well, do we want to retain something that's just never gonna work for someone who's got low vision or no vision? Or, do we have 10 other things that work really well and so, we're just gonna go ahead and say, yes, we'll keep this?" (Exhibit professional, LSM)

Oscar also notes that the staff members seem to be persistent in their attempts to make the exhibitions more inclusive. Even when they bring new designs to him and he tells them that the design isn't working for him, they will gladly go back and make revisions, engaging in an on-going process of improvement through continual feedback:

> When we were working with different exhibits and how to make them work . . . [they] went through several different rounds of evolution, but [they were] never . . . really upset or disappointed, they were more like "Oh, okay," and they'd just go back and rework it and come back with it.

When engaging in this feedback process, Oscar largely draws from his personal experiences to decide what will work and what will not. He and others from LSM also look to other museums to find solutions to some of the challenges they face:

> One of the things I really stressed from the beginning, too, and [exhibit developer] really grabbed on to this, was I said, "Let's not waste our time here trying to reinvent the wheel. Who do you know out there that's doing this and has done this before? And what have they done?" And he said, "That's really a good idea." So he did a lot more research that way, too, to talk with other museums.

Oscar feels that, over time, the organization has really learned about inclusive practices by working with him:

> [I] recently . . . told them, "You guys are just . . . getting it." They say, "What do you mean?" I go, "Before I even come down here, you have so many interesting things already put in there for accessibility, and you've been thinking about it."

Oscar also feels he's been able to have an impact beyond just staff members as he also reports influencing other individuals who partner with LSM:

> A great example is with the [current science exhibit], at the day we went around and looked at the prototypes, and I was paired up with a scientist. And afterwards, the scientist said, "Oscar, this was the most enlightening experience I've ever had. I've never looked at these exhibits from the way you did." He was just really excited about it. And I thought, "You know, that's why you bring me in on these things, that's why you have me here . . . to show that."

Staff members who have worked with Oscar in the past agree that they and others have learned a great deal about inclusive practices by working with him. They report that they have integrated those lessons into their thinking about practices that are inclusive of people with disabilities at LSM:

> We had somebody who came to our exhibit team meetings on a regular basis, not every day, or even every week, but often enough . . . that he really helped us think about how to design exhibits for blind people. . . . You'd say, "Oh, that's a great exhibit. . . . How would Oscar use it?" or Oscar would say, "This [is an] interesting idea, how about doing it this way? What if I could feel the control . . ." or whatever it happens to be. (Exhibits professional, LSM)

Staff members have also come to learn the value of working regularly with people with disabilities by working with Oscar, and after working with him closely, now see the involvement of people with disabilities as a critical way to make the Museum more inclusive:

> We've always gotten the most value out of bringing in advisors who have various disabilities and who just work with us really directly. So we have a guy who consults with us all the time who is blind and . . . sits on [a local] council of disability. . . . He knows how to advise and he's got a lot of expertise. So when you start to bring somebody like that in or a couple of different folks like that in . . . who have different situations and contexts, you start to get solutions that can work across or solutions that might work differently than if you were just doing it in isolation by yourself. . . . And there's a . . . practicality that somebody with experience like that brings to it. I think we often as abled people come up with solutions that we think will work for disabled people and will be universally accessible but aren't nearly as good as when you talk to someone who actually needs to use it. (Exhibits professional, LSM)

The learning that is taking place, however, is not just one-way. Oscar reports that he also learns a lot about museum practices and inclusive practices by working closely with LSM:

> I've learned a lot about the inner-workings of a museum by being involved here. A silly one is I've learned how they can really make things out of just anything. You know, they get to be really creative . . . and as far as with inclusiveness . . . , I think I've learned that . . . many of the people here really do want to make it work and make it happen. And I've also

learned a lot of the frustrations they can run into with, as far as if things will work or not.

In addition to having positive feelings about his involvement as a consultant at LSM, Oscar feels that overall LSM is a very accessible museum and enjoys it as a visitor:

> I also do like that . . . almost every [film] has an audio description. I like the way they run that whole situation with the audio description, where they'll have the reserved seating area, all those types of things I think are done extremely well. . . . Most of the staff is very open and very polite, very friendly - they don't overreact to a person with a disability. . . . But I think overall, they do a good job. Another thing I think this museum does very well—they could probably hire more—but they do have some people with disabilities working here. I know of one who . . . works down on the ground floor here. She's . . . helping out people and directing them, and playing with kids and whatever, and she's in a wheelchair. I just think that's fabulous because kids are getting, whether they know it, a double dose here. They're getting science and they're interacting normally with a person with a disability. . . . That speaks volumes in my book.

This is not to say that Oscar does not see the need for further change. Oscar mentions a number of areas where improvements could be made at LSM. He feels the Museum needs to put "a little more effort" into addressing inclusive practices during "orientation, when they are gearing up new staff." He also thinks the Museum would benefit from "a person on staff [whose job] . . . would just be . . . to work with the

Museum to fix it up totally" with regards to the inclusion of people with disabilities. He also reports a need for the Museum to do "more reaching out and inviting [of] the disability community to the Museum." As he states, "I mean it's one thing to develop it, but who knows about it?" Finally, Oscar feels it is critical that LSM comes out with a firm statement expressing its commitment to the inclusion of people with disabilities:

> I still really feel that the action that needs to be taken, the whole issue of inclusion, the whole issue of accessibility, needs to be a very strong stated mission statement of the Museum or directive or goal, however they would want to break it down. I think it has to be out there that we are really wanting to work on this and then go from there.

Oscar feels that some of these actions could be possible if the President of the Museum made a public statement that was in favor of the inclusion of people with disabilities:

> I think it always has to start at the top. I've never had really the opportunity to sit down and talk with the CEO here, the President, and see where he's at with it. If he were to come forth and say, "This is something that is a priority, and I want us to work on it," I really feel that it would come down the pipe . . .

Oscar acknowledges that some of the changes that need to take place are outside of the control of the Museum; there is a need for the city to also take actions to make the surrounding area more accessible. This idea is best demonstrated in his discussion of the

actions he and staff members took to try to get an accessible streetlight installed in front of LSM:

> Outside the Museum here is a controlled intersection with a button you push to get across. When I was working here, I'd always had to have [name of exhibit developer] go with me to cross the street because it's very difficult to tell and I get very nervous about that intersection; it's a busy street. We went to get a letter written to get an audible crossing put outside here . . . and the city [was] . . . very hesitant to put in a new light. . . . Hopefully, someday it will be changed.

Despite these challenges, Oscar feels his overall experience working with LSM is a positive one. He would like more museums to follow its example of "making [inclusion of people with disabilities] a priority, making this a mission or a goal."

Connections between Oscar's experience and other staff members, volunteers or consultants with disabilities. Oscar's comments about his experience at LSM align in many ways with those of other full-time staff members, including those with and without disabilities. Oscar is not the only person with a disability who works at LSM; this museum involves people with disabilities as staff members, volunteers, consultants, and advisors in a myriad of organizational areas. Two of the full-time staff members who are participants in this study self-identify as having a disability, and other staff members report that there are other individuals with disabilities who work at the Museum as maintenance workers, administrative staff members, or volunteers. As the President and CEO states,

> I think we benefit from having a well-integrated workforce including people with disabilities in design, prototyping, education, public programming, and they're the colleagues, friends, and reviewers for other staff as other staff are for them. . . . We have daily experience with each other . . . janitorial staff whom I sign to everyday, and staff who need accommodations for technology development. . . . A common value is the value of each other and inclusive hiring practices—highly valuable people, some of whom happen to be disabled.

Another professional who works in the Office of the President further elaborates on this idea:

> One of the things that I noticed when I first arrived here is that there were people with varying abilities working in very visible places in the Museum as well as behind-the-scenes. Sometimes . . . institutions may do hiring of people with disabilities, but they're sort of not visible to the public. They're in areas that are administrative. One of the things I do think that's different here is that it really sort of cuts across all levels of the organization both in really public spaces and well as behind-the-scenes.

Similar to Oscar, other people with disabilities who work at LSM view this museum as being highly committed to inclusion:

> I would say accessibility is a value around here . . . I think the [Large Science Museum] . . . generally does a really good job on accessibility. Granted, there's always something that can be improved, but I think the

> Museum is really open to it. I think they're very good about addressing needs when they're brought up by staff or visitors. (Professional who uses a wheelchair, LSM)

It is also a feeling that is expressed by people without disabilities who work at LSM:

> I think I would like you to take away that LSM [has] . . . a healthy culture with regard to inclusion. We may not have all the systems and means to get everywhere we want to be, but . . . we're committed to it and it is part of our culture, I mean it really runs deep here. I think it's unique, actually. (Visitor Services professional, LSM)

Other staff members also agree with Oscar that working with people with disabilities and seeking their feedback has become an important part of how the Museum thinks the work toward inclusion should be accomplished. Staff members from a variety of areas continually seek feedback from people with disabilities when designing and implementing museum experiences. Sometimes this feedback is formalized in the form of an evaluation study, and other times it is informal feedback where people with disabilities (or their families when working with children) are asked how experiences could be better for them. As one Programs professional states,

> I think that everyone can say that we can do our due effort, so if there's something specific that we know that can be done to make our programs more inclusive then we'll do that. And really instead of saying, "Well, this is what we're going to do for you," really listening to people, listening to

> participants and parents and kids about what they need and trying to make that happen for them.

Another Exhibits professional expresses a similar sentiment:

> And the other way, I think is important to me is to bring in groups of . . . multi-abled . . . visitors . . . who are willing to give us critique and do that early in the prototyping process . . . when the exhibits are ready for them, so we're just not giving them things that . . . have no accommodations in them, but that allow to the point where we can genuinely say, "Hey, this isn't working" or the suggestion we get is, "What if you did it this way?"

Other staff members share the idea that that involving people with disabilities in the work of the organization is a way that staff members learn about practices that are inclusive of people with disabilities. This is true not only for staff members' interactions with Oscar, but also of their interactions with other staff members, volunteers, or visitors who are invited to provide feedback:

> The "aha" moments come from conversation, inviting people in to test systems to give that direct feedback. I think it's invaluable to have workshops where our staff's minds can be expanded, where you can hear from someone who lives with a disability every day and really find out from them, "That's not really the way that I do it. That's not really the way that I feel about that," or "That's nice but it doesn't fit," or "It doesn't work quite right for me." (Visitor Services professional, LSM)

> And what's neat about . . . the trainings that I've been to, many of the floor staff who either are handicapped or have relatives who are, know how to deal with the situations and you learn by talking to your coworkers instead of having management just give you . . . a broad spectrum of how we treat everybody. (Programs professional, LSM)

Staff members in other areas of the Museum agree with Oscar not only with regards to the positive aspects of inclusion at LSM, but also with some of the potential areas of improvement, particularly in the area of communication. Staff members agree that there is a need for "more communication with each other" about the inclusion of people with disabilities to "make sure we're on the same page for certain situations" (Visitor Services professional, LSM). They also see a benefit in improving communication with visitors with disabilities about the services they provide. As one staff member states: "I don't even know if we have a TTY. That's crazy that I don't know it, and I'm out talking to people in the community and trying to [help them] find ways to access what we have here" (Programs professional, LSM). Finally, they feel an overt and public statement by LSM acknowledging its commitment to inclusion is a necessity, as such an action would play a critical role in guiding the work as it moves forward:

> But I see lots of room for this to be where [names of different divisions] get together and say this is our vision for equity and access work—this is our vision for working with a variety of visitors and this is what this really looks like, this is what this is fleshed out to be, and here are the details of

this plan with these core set of values. It's just not clear [now]. (Human Resources professional, LSM)

Another action that staff members and Oscar agree is necessary is adding a full-time staff member whose sole focus is on inclusion. At different points in time, LSM had a designated access coordinator and an accessibility committee. Both the position and the committee were eliminated over time, which some staff members interpret to mean that the institution no longer cares about the inclusion of people with disabilities:

> I would like to have one person as the go-to person . . . or have a committee with people responsible for . . . different roles. . . . We need to be serious about committing to that again. (Programs professional, LSM)

The Museum does, however, have someone who is focused on ensuring that it is in compliance with ADA, although this is only a part of this person's responsibilities:

> Most recently we made disability access and awareness a component of a job description in one of our leaders in facilities. He is now managing access planning. He is our public safety officer, he has been doing this for years [fixing areas to make them more ergonomic for employees], but we've never given him more vested authority. (President, LSM)

As with Oscar, other staff members feel unsure about the extent to which the Museum's Senior Leaders view the inclusion of people with disabilities as a priority:

> I just don't get the message from Senior Leadership in a very visible way that this is a priority or a value. That said I don't think they don't value it, but I just don't think it's being asked to be on our radar like it should be—

like what are we doing as a metric? What are we doing to articulate a vision that would include folks with disabilities? What does that look like? (Human Resources professional, LSM)

It is important to note that both of the participating Senior Leaders of the organization express strong support for the inclusion of people with disabilities at LSM. They are highly knowledgeable about the topic (one Leader is even fluent in sign language) and have personally taken many actions to advance the inclusion of people with disabilities within the organization. The problem, perhaps, may not be a lack of Senior Leader support, but rather a lack of communication to staff members that there is support from Senior Leadership.

Another commonality between Oscar's perceptions and that of other staff members is that the accessibility of LSM is hindered in many ways by the external context of the city within which the Museum exists. While a few staff members share Oscar's concern over the external street light, another staff member who uses a wheelchair raises another concern—street maintenance. At times, the way the city and other businesses attend to maintenance of the surrounding streets and sidewalks can limit travel to the Museum by wheelchair users.

There are other aspects to Oscar's experience at LSM that are not discussed in this section, but are instead addressed later in the case in the description of the Exhibits department. Given Oscar's extensive involvement with the Exhibits department, it is not surprising that many of the processes and contexts that Oscar describes as being part of the institution's work toward inclusion are also reflected in the description of the work of

the Exhibits department provided below. These include focusing on the inclusion of people with disabilities in large projects, thinking about inclusive practices from the beginning of a project, learning about inclusive practices through an on-going experimentation and feedback process, and learning from the work of others.

Oscar's story provides insights into how LSM involves people with disabilities in its work, providing a description of the experiences of an individual who has a more intimate relationship with the organization than visitors such as Fred and Holly who visit only a few times a year. Combined, these two lenses—that of a consultant with a disability and visitors with disabilities—provide an overall indication of the kinds of actions LSM takes and does not take to make the environment more inclusive of people with disabilities. Given Oscar's inside status, his thoughts and reflections also yield some beginning insights on some of the processes and contexts that either impede or facilitate change at LSM. To dig deeper into understanding these processes and contexts, however, requires a closer look at the workings of the organization and its various departments and teams.

Viewing Inclusion through the Lens of the Courses and Camps Program

Like many museums, the suite of programs offered by LSM includes summer science camps and weekend science courses for youth of various ages. Unlike on-the-floor programs in museums that typically last only five to twenty minutes, camps and courses utilize a longer timeframe where museum educators work with youth for as little as a few hours to as long as a full week or more. These programs function more like school classrooms than other museum programmatic areas; typically, there is one or two

educators who lead 10 to 20 children in hands-on science activities that take place in designated classroom areas.

The LSM Courses and Camps program is known throughout the organization for its work related to the inclusion of children with disabilities. Staff members from a wide variety of departments and divisions mention that they think the inclusion of people with disabilities "is probably the most robust" in the work of this program (Programs professional, LSM). The leaders and staff members of this program are described as "really passionate people who are thinking and working on behalf of people of differing abilities" (Exhibits professional, LSM). They are considered by many in the Museum to be taking extra efforts to be inclusive, "really . . . bending over backwards when parents want to sign up kids with a disability" (Facilities professional, LSM). Their efforts are generally appreciated:

> Another area that's been doing tremendous work is our [Courses and Camps] programs; I know that they really try to accommodate autistic children—I appreciate that a great deal—and also children living with profound allergies. They've really made an effort. (Human Resources professional, LSM)

Beyond staff member recognition, the professionals who are a part of the Courses and Camps program report that some parents of the participating children are aware of the efforts being taken to include children with disabilities in the program and are appreciative of what is being done as well. According to one staff member, ". . . a lot of parents keep coming back and they say a lot of . . . things about [our] efforts."

Furthermore, the Leader of the program feels that the recognition extends beyond just participating parents:

> We have good parent word-of-mouth. . . . We have a really, really, good reputation with the food allergy network and parents talk, as you know. And we have a good reputation in the autism community. I mean [name of autism organization] listed us as a program of choice for parents.

One mother of a daughter who is on the autism spectrum who is a participant in this study reports that she appreciates the Courses and Camps program so much that the program is the primary reason she renews her family's Museum membership each year:

> The big thing about membership is it gives me a break on tuition for the . . . classes, which I think we've generally have taken one or two a semester, because I home school . . . and . . . we had a lot of camps last summer. [Daughter with autism] took pretty much all [LSM] camps. . . . She went almost weekly.

In addition to the Courses and Camps program being known for its work to be more inclusive of children with disabilities, the Leader of this program is also acknowledged as "someone who people come to when they're thinking about inclusion" (Programs professional, LSM). She is identified as a champion for inclusion of people with disabilities by participating staff members from exhibits, evaluation, facilities, visitor services, and programs.

The fact that the Leader of the Courses and Camps program is known for her work toward inclusion throughout the organization may be related to the high number of

interactions that she has with staff members who work in areas across the Museum. According to the Leader of the Courses and Camps program, she works closely with many areas of the Museum, including:

> Learning technologies . . . school outreach . . . I worked some with research and evaluation . . . print graphics, let's see, human resources, of course, teacher professional development . . . museum programs . . . museum enterprises . . . [Leader of Visitor Services] and her group mostly . . . Accounting . . . Development . . . [her manager] . . . director of [program development] . . . my staff from my old position . . . the occasional teaching staff. . . . There's a bunch of other people. The [Visitor Services staff members] . . . I've work extensively with them . . . [name of the Facilities professional] . . . [name of someone in the office of the President] . . . she's been sort of an informal mentor, and now that I'm in my new position that's gonna be more formalized . . . I kind of see everybody . . . I'm an extravert so, I check-in with a lot of people. Maintenance . . . engineers. I say I work least with the exhibit shop people. Oh, I see [name of exhibit professional] a lot. I mean, she's a friend too, but we are working on the [grant name] together, [name of three other exhibits people] all those guys I've known for a long time.

This Leader and other staff members report taking a number of actions to ensure that children with a broad range of disabilities are included in the Courses and Camps program. These actions include:

> Calling parents ahead of time [and] asking if there's any [strategy], any special accommodations we can make for their kid because they will, when they register, list any special needs. . . . We've done training for our instructors on different specific disabilities. We had the autism society come in and give a presentation. . . . We do have a lot of children come through on the autism spectrum, so whether or not we know there's a student in class, we try to make it a friendly environment and putting agendas on the board, we've gone through a lot of trainings with instructors to do that . . . things like having large timers in the room so it gives kids . . . a visual of how much time is left in an activity.

Some of these actions are seen as not only being beneficial for children with disabilities, but for all children as well. As one Senior Member of the Courses and Camps program states,

> A lot of what we talk with instructors about they end up saying, "Well that was helpful for everybody in class whether or not the student had a disability or a known disability." So they become surprised by how it helps overall with their teaching as opposed to having to make a special accommodation for one student, that's frustrating.

The Leader of the Courses and Camps program takes extensive actions herself to ensure that each and every child that needs an accommodation is attended to:

> This summer we had . . . a . . . science class and the teacher was using essential oils, and we had this mom who said, "Oh, you've been so great

> with what activities you've done and my kid has [a] nut allergy and it's airborne, and you've been so great about checking everything, but [we] knew the class was a little risky for him to try to take." So we looked at the materials list together, and it said essential oils and they were in the classroom. And I asked our Materials Coordinator, "Do you know if any of these contain almond oil?" And we didn't know if that was going to trigger him or not, but it was a good idea to get him out of the classroom, so I pulled him. . . . And we . . . checked some other oils we had in the cabinets that had all of the ingredients listed so that we could see that they were safe for him to use.

While formal trainings (such as the autism professional development experience cited above) are a part of how the educators learn about practices that are inclusive of children with disabilities, learning through an on-going reflection process that is embedded within practice and involves testing out new ideas appears to play an even larger role. As stated by the Leader of the Courses and Camps program, staff members need to "try something else until something works." According to this Leader, given that the Museum fosters a "culture of innovation," staff members feel "pretty safe to make errors." In turn, staff members in the Courses and Camps program report that learning through practice is the most useful way to learn about inclusion:

> I've seen that trainings can be helpful, but you have to have that practice that happens after the training. You can't just sit in the room and hear from people. Really the learning happens when you sit down with a kid

> with autism and try and have a conversation with them and see how maybe you can pull them back into a conversation. . . . I thought that the lecture was great, but it was important to be able to have the one-on-one experiences. . . . We're doing a lot to be inclusive but that there's always more that we can do and having those conversations and having those safe spaces for us to discuss—that is really important.

This process of learning through practice is also reflected in how the staff members report making decisions about the kinds of formal trainings the staff require. The characteristics of the children already attending the program seem to help staff members identify the kinds of training they need:

> At our training workshops, probably starting about 10 years ago, we included working with kids from the populations that we see mostly, which are kids with autism spectrum disorders, kids with behavioral disorders like ADD and ADHD, and we started to see a huge population of kids with life threatening food allergies. (Leader of the Courses and Camps program, LSM)

Despite all of these actions, staff members report that the Courses and Camps program can still be improved when it comes to serving children with disabilities. Some of the challenges stem from lack of sharing of ideas and knowledge between parents and the staff members running the programs. As one Program staff member reports, "some special needs [are not] disclosed and so that becomes frustrating because why don't parents tell us, and we can make it easier for their kids?" Other challenges come from a

lack of shared ideas about best practices between the various staff members (which include full and part-time personnel) who are essential to running the program. Although the Leader of the program and other long-term staff members support and value hands-on or experiential learning activities, some of the newer part-time personnel have been observed by the Program Leader to "speak for like 20 minutes to 7 and 9 year olds", which she reports negatively affects children with autism who participate in the program and also makes some of the other children "get squirrelly."

The largest challenge the Courses and Camp program currently faces, however, is the intense internal debate within the organization about how far the staff members should go in making accommodations for children with disabilities. The question that is often posed is: "Do we want to draw a line" when it comes to kinds of accommodations the Museum is willing to make? This debate takes place mostly amongst a small group of professionals—the Leader of the Courses and Camps program, professionals from Human Resources, and a professional from Facilities—who are charged with making decisions around what kinds of accommodations and services the Museum should offer children with disabilities who participate in the Courses and Camps program. In addition, another employee who works in the Office of the President is also consulted on this issue from time-to-time based on both her position in the organization and her extensive background in special education. During staff member interviews, this topic is frequently discussed and appears to be a frequent source of internal debate.

The issue of how far the Museum wants to go to include children with disabilities in the Courses and Camps program recently came to the forefront when a request came from a parent whose child has diabetes. As a Courses and Camps staff member describes,

> One thing that we've struggled with is . . . how do we find the line where we can do what's needed to include kids but not go beyond? One of the things that we've been working with is kids who have type I diabetes and at what point are we offering medical care for them that we're not actually certified to do? Can we actually work with their problems? That's actually something that we're still going back and forth with on—how can we make sure to include these kids and still be safe for them and not overstep our abilities?

According to the Leader of the Courses and Camps program, however, the situation of this one family is not an isolated incident. There are other children whose parents make requests and the Museum is unsure as to whether and how to fulfill them. For example, there was a "kid with Muscular Dystrophy" whose "mom had added that he needs help with toileting." There was also "a little girl who was in preschool with the osteogenesis imperfecta" whose "mom asked . . . if the teachers could help her with toileting." There are also situations where further personalized assistance is needed for certain children who are on the autism spectrum:

> Then we had a kid with autism who was in some of our camps, and he had pretty severe autism. And he had taken a lot of learning technologies classes. And his mom speaks Korean and is not English proficient. So that

made the communication really difficult because the child . . . was almost aphasic so he didn't speak much. . . . And he took off from the group and ran into the streets several times . . . and that's where talking to the mom every day and saying, "This is an unsafe situation; we have to remove him from the camp." And we had no idea whether we could prescribe that she provide one-on-one to accompany him to make it a more successful class.

Depending upon who you talk to, the problem that needs to be addressed is framed differently. The staff member who works for the Office of the President expresses concern over the kinds of discussions that are and are not taking place around inclusion:

If I come back to the proactive nature versus the reactive . . . one was a kid who needed a sign language interpreter and the other is bumping up against kids who have a particular disability such that it requires some additional attention on the part of the camp staff during the day. . . . Now in this case, I think they had sort of a patchwork thing to make those two to three weeks work, but you see it's kind of gone away. There's not an on-going dialogue right now about, "Oh, what did we learn from that? What could we put in place? What would we need to do with staff?"

The Facilities professional sees the problem as the result of a tension between being as inclusive as one can possibly be, and the liability of the Museum:

[The Leader of the Courses and Camps program] just wants as much as an all-inclusive offering of classes and camps for kids that she can get. Period! That's her focus, that's her goal. My goal, and I agree with her,

> but I also have to balance with the [Large Science Museum's] liability and where we're going with that. I mean, I can appreciate where she's coming from and I understand where she's coming from and I'm very happy to support where she's coming from, but I also have this aspect of me where I have to balance where the Museum's liability is and where we're comfortable with placing that and she understands that as well.

Conversations with the Leader of the Courses and Camps program confirm that she does understand this tension, but she also sees the debate as being connected to the Museum's obligations for meeting the requirements of ADA. She feels the answer to this debate may lie in what the Museum is *required* to do to ensure the inclusion of children with disabilities:

> I had been kind of nosing around on the ADA website and [started] reading some stuff about daycare centers and the history of judicial decisions about daycare centers. And one of them was about a child with diabetes and that it was considered not reasonable accommodations for the daycare centers to require the parents to come and test glucose and to help with the meter and stuff. In fact there are a couple of them. So there are these settlements, these decisions . . .

The Facilities professional, however, does not see ADA as being as pertinent:

> We're not a school. We do hold classes and we do have teachers, but we're not a school. We're not beholden . . . to the same standards . . . apparently there are some daycares, there are some schools who have been

> forced to do this by ADA law. And I'm just, I guess I'm very surprised that the law would force that level of liability onto an institution, be it daycare, school, or whoever. So we're discussing things like that . . . my job is basically protector of liability, is to bring concerns to the table and make sure we're comfortable as an institution with the decisions we make and how much liability we're willing to take on.

Given that the Museum's requirements according to ADA were beginning to take prominence within this debate, the team working to solve the problem decided to consult a lawyer, but even to the lawyer, the requirements related to ADA did not seem clear. Therefore, there was no immediate answer available about what the Museum was required to do from the perspective of ADA.

The professional working in the Office of the President thinks that the focus on the ADA is a red herring and that the Museum should be focused on deciding not what it is required to do, but what it feels is the right thing to do:

> The thing about law is that laws set a minimum standard. It says, "Here's the minimum that you must do." Then it gives great leeway on everything else. I think sometimes what we come up against is sort of where people think there is a moral and an ethical stance at play, not just the legal one. . . . So that's the kind of stuff where you need headroom to be able to debate, discuss, come to consensus about what an institutional program will do, what it could do, what it must do.

In an effort to move the conversation away from ADA and find out what the correct course of action should be, staff members from the Courses and Camps program are also investigating what other museums and community organizations are doing to make their courses more inclusive. The Program Leader, however, is finding out that not many museums are addressing this issue:

> I talked to [accessibility coordinator] at [another large museum] and I found out that . . . they have never had a kid with ASD. . . . So I called a couple of museums . . . one of my staff called a few out of school time places. The zoo camps, Y camps, stuff like that. I've talked to the program coordinator at this residential Y camp and she basically said, "Oh, we don't deal with that. There's a camp up the road that's for kids with special needs. I would send the parents there."

The debate is a great source of tension within the organization. The Leader of the Courses and Camps program reports that the tension is beginning to wear on her:

> This meeting was so upsetting to me that I went to [person who works in the Office of the President]. I felt like I was alone. I said . . . "I feel like every time I come in here, it's one person with my perspective, and three of you with your perspective of protecting the Museum's interest. I'm not going to operate like this anymore. I can't. It's too stressful."

Connections between inclusion in the Courses and Camps program and other LSM areas. The Courses and Camps Program is in many ways a unique situation within LSM. Nowhere else in the organization is there so much debate about the

boundaries around which inclusion should be drawn. Also unique is the extent to which the Program staff members are making specific, individual accommodations for all participants as needed. In this way, the program is very responsive to the needs of the children who sign-up to participate in the program. The emphasis on potential liabilities also does not appear to play as strong of a role in other areas of the organization.

There are themes that appear in the story of the inclusion of children with disabilities in the Courses and Camps program, however, which do resonate with themes from other areas of LSM. Certain themes, such as the involvement of people with disabilities in the work of the program and how the staff members report learning about inclusive practices through their interactions with children with disabilities, connect closely with those discussed through Oscar's experiences with LSM. Also connecting to Oscar's experience are some of the communication issues experienced by Program staff members when working with the parents. While Oscar highlights the need for more communication with the local disability community, staff members from this program emphasize the miscommunication that can sometimes happen when working with parents of children with disabilities. Similarly, there is some overlap with Oscar's call for a clear overall organizational policy related to the inclusion of people with disabilities, and the Program staff members' call for a clear organizational policy related to the kinds of inclusive practices LSM is willing to employ for children with disabilities who attend the Courses and Camps program.

Another connection to what is discussed above is the inconsistency in the practices employed by the various educators who implement the Courses and Camps

program. This is similar to the inconsistencies that emerge as a problem area through the focused observations of the visitors with disabilities in the exhibitions, and is an observation that led Oscar to suggest that greater communication is needed between staff members at LSM.

There are some new themes that emerge in the story of the Courses and Camps program as well, which also connect to other areas of the organization. One theme is the role of the Leader of the Courses and Camps program, who is seen not just as a champion for inclusion within her own programmatic area, but also as a champion within LSM as a whole. Participating staff members also cite multiple other staff members as being champions for the inclusion of people with disabilities in the organization. The individuals who are thought of as champions are dispersed across a broad range of organizational areas (Visitor Services, Exhibits, Research and Evaluation, and the President's Office) and levels (Non-managers, Managers, and Senior Leaders). Staff members feel that these champions are essential for bringing discussions of inclusion to the forefront and for pushing the work forward:

> It appears to me . . . that one of the markers in this institutional culture is that . . . an individual needs to step up and be the champion for change. Unless there is one person who is being the nudge, nothing will happen. You know, it really is about one person because it's not even about, "Okay maybe there's four or five of you that have it." It really does seem predicated on if there is an individual who decides that they want to go to

> the mat for it then something will happen. (Professional from the Office of the President, LSM)

Perhaps, unsurprisingly, given that these champions are seen to hold the banner for inclusion at the organization, other leaders report sentiments similar to those of the Leader of the Courses and Camps program; the work of inclusion can be difficult and emotionally draining:

> I find that inclusion work is hard, lonely, and isolating work—real inclusion work. It's one thing to sit and say, of course, we need to hire more people of color, or, of course, we need to make the Museum more accessible. Everyone can say that, but that's hard work . . . I've learned that the more resistance I encounter, the more important it is that we do the work because resistance is a metric for me of where the disconnect is. It often puts you in a sacrificial position, both with your relationships internally as well as with your own self-confidence. (Human Resources professional, LSM)

Another common theme present in the Courses and Camps description that also occurs in other areas of LSM is the use of trainings and professional development programs to inform staff members of practices that are inclusive of people with disabilities. Multiple programmatic areas report that they have held staff trainings around the inclusion of people with disabilities at LSM in recent years. In addition, observations of a training program for volunteers show that discussions of inclusive practices are embedded within regular trainings. For example, when volunteers are discussing how to

interpret objects from the Museum's collections with varying kinds of visitors, one of the scenarios these volunteers specifically discuss is how to interpret an object to a blind visitor who is highly knowledgeable about content related to that object.

There was one particular staff training on accessible practices that took place in the early 2000's that was led by an external industry organization that appears to have had a memorable impact on staff members across the organization. One Exhibits professional remarks that this workshop was "pretty pivotal" in his development as a professional. Another Exhibits professional states that this workshop "raised the awareness" across the entire Museum about inclusive practices and served as a "catalyst to get a lot more going on." A professional from the Visitor Services area concurs, and feels that this workshop "did change things, certainly. It changes culture; it changes the way you do your work and the way you think about new things coming in."

Another theme that is consistent between the Courses and Camps program and other areas of the Museum is the use of external resources—community organizations, other museums, web sites, literature—to inform new practices and decision-making around the inclusion of people with disabilities. This is something alluded to in Oscar's description of his experience at LSM and is reported as taking place in almost all areas of the Museum's work toward the inclusion of people with disabilities. The Museum's President states that "one of the strengths is that we have . . . a powerful external network where we can draw expertise where we are lacking."

In some cases the Museum relies on formal partnerships with other organizations to conduct its inclusion work, such as with a "local school for the deaf, [the] state school

for the blind" as the President reports. In other cases, professionals in the Museum rely on informal methods to learn from the experiences of others. As one Exhibits professional states, "I have seen some really wonderful exhibits that are inclusive in a way that were eye opening to me. And so simply by . . . visiting other museums, I think that informs the work here." Others are more systematic in their approach at learning from others, and report calling around to different museums to learn about accessibility in their theaters, making decisions about whether or not to host a day that is focused specifically on one disability audience by asking other museums about the success of such days, or establishing relationships with local regulatory bodies as a way of keeping abreast of changes in the law related to inclusion.

One theme that emerges subtly in the story of the Courses and Camps program that also appears in the backdrop of other organizational areas is a focus on dialogue and discussion for solving problems. Just as a formal group for discussing accommodations within the Courses and Camps program was formed to find solutions to this particular challenge, discussion and dialogue is also seen as an important way that the organization makes decisions about inclusive practices in other areas as well. The importance of discussions is implicit in the way that staff members describe how work gets accomplished, with the words "discussion", "dialogue", and "conversations" appearing frequently in staff members' comments. For example, staff say, "I also know there's been a tremendous amount of discussion and work around signage . . ." (Human Resources professional, LSM), or "I know there is a lot of dialogue around hiring practices and trying to help managers with their skillsets around . . . accessible and diverse hiring"

(Professional from the Office of the President, LSM), or "When we talk about the exhibit as a whole, [we] talk about how we are going to allocate resources to achieve the [accessibility] goals that are outlined." (Exhibits professional, LSM)

In addition to the themes that are shared between the Courses and Camps program and a broad range of other areas in the Museum, there are also a few areas where connections can be made specifically between this program and the work of the Exhibits department. These include the emphasis on learning through practice; a feeling that certain practices are "better for everyone;" a sense of the work toward inclusion as being on-going, iterative, and improving over time; and a feeling amongst the staff members that ADA is a strong influencer in the decision to make the Museum more inclusive. Connections between these emergent themes from the Courses and Camps program and other areas of the Museum are mostly present within the work of the Exhibits department, which is described in more detail below.

Viewing Inclusion through the Lens of the Exhibits Department

The lens of the Exhibits department affords a unique vantage point for viewing changes toward the inclusion of people with disabilities over time at LSM. Multiple participating staff members report having worked at the Museum for 15 years or more, which provides the opportunity to hear a longitudinal view of change directly from the people who participated (whether willingly or reluctantly) in the effort. In addition, similar to other museums, the exhibitions present in the Museum's galleries are changed or remodeled on a relatively infrequent basis, thus, providing insights into particular design strategies that were employed at different points in time. Currently viewable

exhibitions at LSM date back to the time when the new building first opened, in the 1990's. Combined, these two attributes of the Exhibits department (long-term staff members and long-term exhibitions) enable a longitudinal view of change that cannot be afforded by another area in the Museum.

Before examining the change that has occurred over time at LSM, it is useful to note what the current state of inclusive practices is at LSM when it comes to exhibition design. The following excerpt from observational field notes, which describes a meeting where the design of a new exhibition is being discussed, provides insights on how the Exhibits department currently thinks about inclusive design:

> The Senior Leader of Exhibits begins the meeting (which is attended by about 10 to 15 people) by talking through a PowerPoint presentation that contains images from exhibitions he and others visited around the world. These exhibitions all address topics similar to the topic of the exhibition being planned. Behind the screen where the presentation is being projected, the wall is lined with large sticky pad sheets that have titles written on them, such as "Audiences," "Goals and Messages," "Visitor Experience," "Design Ideas," "Sources of Inspiration," "Timeline," and "Accessibility/Language." Once the presentation is over, the Senior Leader informs the group that this topic is one that is of high interest to the audience, as determined through rounds of audience testing. He states that the purpose of the meeting is to complete the "matrix" that is currently on the walls. The group works to fill-in what is known about each of the

components of the matrix. The first sticky pad sheet on the wall is “project scope.” Known facts about the project scope (such as how big it will be, when it will open, and its overall cost) are listed under this title. The second sheet has the title “Audiences.” To fill in this sheet, the group begins to discuss a wide range of audiences. Some of these audiences were already identified in a successful grant proposal for the exhibition, and are not up for discussion. These audiences include families and kids from local underrepresented communities. The Lead Exhibit Developer, who is cited by many in the organization as being a champion for the inclusion of people with disabilities and who has worked closely with Oscar in the past, also states that the proposal promises “English, Spanish, and [to be] fully accessible to visitors who are blind, deaf, and wheelchair users.” He specifies that “fully accessible” means that if someone can’t experience a particular aspect of the exhibition there will be another equivalent experience. The only place where he perceives there will be a need for an alternative experience is the simulation ride they have planned, which will most likely be inaccessible for wheelchair users. The current plan for the alternative experience is that it will have the same visual experience and content, but there would be no corresponding movement. The Lead Exhibit Developer reports that he saw this technique applied in another museum where the alternative experience is to be used by children who were afraid of the simulator ride. He feels the alternative experience in the

new exhibition could be designed for use by both children and wheelchair users. It is the idea of an alternative experience for wheelchair users that prompts an in-depth discussion amongst the meeting participants:

Person 1: [I] know a whole, like, a lot of guys like [the staff member in Exhibits who uses a wheelchair] who could wheel in and then strap on and he'd be able to get that movement.

Person 2: [It] wouldn't work. For everyone like [the staff member already mentioned], there are 10 others who wouldn't fit in there that way.

Person 3: BUT, we could hurt someone if not strapped in correctly.

Lead Exhibit Developer: We wouldn't want to rotate [the simulation] back, but could still have many other simulations.

Person 4: [But then] younger kids would also defer. [They] get wigged out at the last minute and decide that they don't want to [do it]. That's how it is handled in [another museum].

Person 5: Make the [alternative] space have chairs so that people without wheelchairs can still use it. Even have them strap in and get the feeling like they are going somewhere . . .

The group moves on to discuss other items, such as reduced admission for those requiring financial assistance, and the content of the educational goals.

As the above field notes suggest, the inclusion of people with disabilities is a regular part of the conversations that take place when the Exhibits department builds new

exhibitions. According to long-term members of the Exhibits department, LSM has been discussing the inclusion of people with disabilities since they first began working at the Museum:

> I think these kinds of discussions have been going on as long as I can remember working here. So I don't really think suddenly there was some point at which people said we should address accessibility issues. I'm sure that we've gotten better at it. I don't remember . . . when was ADA? . . . Just based on how we react to stuff like that, that was a watershed moment in feeling like we have to get way more serious about it. And I do remember talking very specifically about ADA issues at some point after ADA was passed, which obviously we weren't talking about before that. . . . I think the first exhibit project I worked on was [name of exhibition]. And in my memory, which is shaky at best, that had to have happened around the time of ADA legislation, and I think I remember talking pretty specifically about some pretty basic ADA accommodations and guidelines as part of that project. And even though we didn't follow all of the suggestions it was a pathway to our ADA best practices.

Although the Museum had been discussing and implementing some practices that are inclusive of people with disabilities as early as the 1990's, participating Exhibit professionals report that it was the professional development program implemented by an industry organization in the early 2000's (the same one as cited above) that elevated the practices of the Museum in this area and provided a new "energy and momentum" as

well as “accountability” that focused their efforts toward inclusion. Even one of the newer staff members of the Exhibits department mentioned this professional development experience as being “great” and “really informative,” although she attended as a professional from another museum.

Following the industry organization workshop, LSM experimented with new inclusive practices in a few exhibitions, including an exhibition about human health where audio labels and tactile elements were specifically added to make the exhibition more inclusive of people who are blind or have low vision. Staff members do not discuss these exhibitions during their interviews, even though they are still present in the exhibition galleries today.

The next major event staff members mention is a traveling exhibition built collaboratively by LSM and the industry organization that ran the professional development experience. This exhibition had a sound-based theme (called “Sound Exhibition” here), and was funded by a grant from the federal government. Staff members discuss many practices that they think were exemplary in this exhibition, which can no longer be seen at LSM:

> We developed an exhibition on [sound] that specifically was designed to work for blind people and people with low vision. And so used audio description throughout, used braille labels on controls, used dual language, so Spanish and English. I think it was a bit of a stretch for us. . . . With [Sound Exhibition], we had [Oscar] who came to our exhibit team meetings on a regular basis. . . . He really helped us think about how to

> design exhibits for blind people and what to think about when we suggest stuff. (Exhibits professional, LSM)

This Sound Exhibition is cited as an exemplar of an inclusive exhibition that members of the Exhibit department continue to refer to when thinking about the inclusion of people with disabilities in newer exhibitions that are being built. One staff member states that he "can't remember a time when we're working on a project and somebody hasn't said, 'What did we do in the Sound Exhibition?'" Another Exhibits professional states "We've adapted a lot of the things that we learned from [Sound Exhibition] for subsequent projects."

Staff members in multiple other areas of the organization also cite this particular exhibition as an exemplary practice for LSM with regards to the inclusion of people with disabilities. One staff member from Visitor Services states that this exhibition was "fantastic for accessibility." Another staff member from Human Resources describes how the exhibit "was extremely thoughtful about visually impaired visitors or those with hearing limitations, and I think it set a precedent for trying to keep it in mind moving forward." Still others in the Museum feel that staff members learned a lot about inclusive practices just by experiencing the exhibition:

> Our . . . best use and well-concentrated . . . use of universal design principles was in [the Sound Exhibition]. [There were] components in other exhibitions, but it really happened there. That became a staff professional development, which is an important realization of this. You can one-off exhibition design, but you are better off in creating the staff

> and developing the staff you retain. We did not outsource the accessibility. . . . That was a turning point in creating an institutional capacity that didn't need to be reinvented each time we created a new exhibit and didn't need to be monitored. Issues of creating an inclusive environment began to foster into the rest of the organization through [Sound Exhibition] . . . for example, one of our youth groups won a national design award for creating a device that helped transfer people from wheelchair to canoe and back . . . value within our community changed. These youth weren't designing exhibits, but were youth who were in a museum where there was an exhibit that was designed to be universal. (President, LSM)

While many cite this exhibition as an exemplar, staff members from the Exhibits department also acknowledge that they "learned a lot from [the Sounds Exhibition] that continues to be applied, but other things . . . have not been applied." Different staff members name different reasons for the lack of application of lessons learned. Some staff members feel that the existing inconsistencies are a problem related to communication challenges. One Exhibits professional who is a manager feels "we just need to recommit to those [accessibility] standards," while another managerial exhibits professional recommends that this situation might be easily rectifiable with "some little, easy to fix documentation" that better captures lesson learned so that they can be applied better from one project to another. Still, another Exhibits professional who works in the construction shop reports that the Sound Exhibition was a "costly project" and other projects "pretty

much . . . don't have the money for it when they come to making the braille or audio equipment."

While the Senior Leader of Exhibits agrees that it "comes down to the resources," he also has another perspective that connects to the kinds of practices from the Sound Exhibition that were and were not applied to future projects. According to this Leader, certain kinds of practices do not lend themselves to being applied to future exhibitions:

> There was a lot of customization stuff that happened in [Sound Exhibition] . . . there are certain adaptations you can make like . . . audio descriptions, which can adapt very universally. But . . . there were a lot of unique custom stuff that happened . . . and I think we haven't carried forth with that as much.

Observations of visitors with disabilities in the Museum's galleries confirm that some of the inclusive practices that were developed for Sound Exhibition were not employed in future exhibitions. For example, some of the exhibitions that were developed by LSM after Sound Exhibition do not have audio labels. In addition, some of the newer exhibitions contained labels with text that is difficult for certain visitors to read, even though creating larger print labels and positioning labels in easy viewing positions does not require additional monetary resources. This suggests that the absence of funding is not the sole reason lessons learned from the Sound Exhibition have not been consistently applied to future projects.

Following the development of the Sound Exhibition, LSM went on to build two newer exhibitions that some Exhibits department staff members highlight as having

exemplary practices related to the inclusion of people with disabilities: one on math built in collaboration with the Outdoor and Explore Museum (one of the two other museums participating in this study), and another on a current science topic built in collaboration with multiple other museums. For both of these exhibitions, staff members described the "accessibility [as] being fairly embedded in it rather than it being this exceptional stuff" (Senior Leader of Exhibits, LSM). According to one Exhibits professional, "Accessibility was called out in sort of the guidelines for the development of exhibit experiences" and, in addition, an "[Accessibility expert from another museum] has done an accessibility review." These exhibitions were also reviewed by Oscar, and each included audio description.

Participating staff members also discuss two additional exhibitions that are in the early stages of development as possible future exhibitions that will embody exemplary practices related to the inclusion of people with disabilities. One of these exhibitions is the project mentioned at the start of the description of the work of the Exhibits department. The extent to which the design and development of these exhibitions will reflect inclusive practices is yet to be determined as these exhibitions are in an early conceptual stage. Observations of team meetings where these exhibitions are being planned suggest that the inclusion of people with disabilities is being considered by both exhibition teams. Not only does the team described above discuss issues related to inclusion, but observations of the other exhibition team show them engaging in a discussion of how to define their goals related to inclusion. During the meeting, the team debates whether they want to keep "universal design" as a goal, or make the goal one

"where we use principles of universal design to create experiences that are physically, cognitively, and culturally appropriately accessible and inclusive."

The fact that certain projects seem to focus on accessibility more than others is widely acknowledged by staff members from the Exhibits department. Staff members are especially aware that there are whole categories of exhibitions where practices that are inclusive of people with disabilities are rarely employed in a way that meets what they see as best practices such as temporary exhibitions that are installed in LSM but are developed by other museums, and exhibitions that LSM builds for use by other science museums. The Museum has spent extra time and money to retrofit some of the temporary exhibitions that are installed at their site and developed by others:

> We had to redesign the interior of the case [for a temporary exhibition]—it wasn't easy. . . . They created a lip so you could get up and get under but that was limited in some ways by some internal piping—because it's an internal climate control case—so there was a height, an angle, there was where the [object] was inside the case that was adjusted, and again I think that helped with glare because there was another piece of glass on the inside. . . . We had to do a lot of modification in order to make it accessible . . . (Exhibits professional, LSM)

Such extensive redesigns are not always possible. The challenge as one Exhibit professional sees it is that "there's not a lot of consistency in the field." While they see inclusion as a value, they recognize other museums do not. "How do we persuade them that it's in their best interest to do it?" (Exhibits professional, LSM)

The Senior Leader of Exhibits also sees that consistency of inclusive practices across internal projects, as well as across projects that are primarily led by external museums, is a challenge. Despite this, he feels that over the long run, their work toward inclusive practices is moving in a more positive direction:

> And so the challenge . . . is that . . . [accessibility for people with disabilities] tends to be episodic. You have a project that comes and then a project that goes. So [Sound Exhibition] we put a . . . higher emphasis on accessibility on that project than we had in any others and any others since. But we had the money in that project to do that and the sort of mission in that project to do that. And, we've adapted a lot of the things that we learned from that for subsequent projects. . . . So . . . there's an intent we try to meet, but don't always meet it the same way. And I think that's good . . . and every once in a while we get something that makes us think about it harder and in more extraordinary ways. So [Sound Exhibition] did that. The [current science exhibition] made us do that. So there are certain projects where we can really push against stuff where you can really take your practices and then they make you push them even harder.

As the Senior Leader of Exhibits implies in the above statement, it is through certain projects that the inclusive practices of the organization improve over time. Working to include people with disabilities is thought of as an on-going process, one where the team is building from lessons learned in prior projects, tinkering along the way

to improve the accessibility of whatever design they are creating, and receiving feedback from people with disabilities along the way:

> I've learned everything over time. Experience. Trying things. Working with people. Talking with people. Submitting myself to criticisms or our projects to criticism. I think prototyping and then re-prototyping, iteration is really important. . . . If you pay attention to what other people have done and pay attention to what you've done in the past, that you can learn from them and improve. So I think it's a gradual improvement. (Exhibits professional, LSM)

This process, of "trying things" and "working with people," aligns in many ways with how Oscar describes the work of inclusion at LSM, where he similarly reports that the staff members in the Exhibit department are continually engaging in a process of design and redesign based on his input.

What has the Exhibit department learned through this process? Some of what they have learned is evident in the areas where there is a consistent practice from exhibit to exhibit, even when accessibility is not a major focus. Staff members who work in the Exhibits department repeatedly state that at a minimum, attention is always paid to the physical dimensions and measurements of the exhibitions (what this group often refers to as "ADA"):

> I think our general best practices are that we reflect on the existing standards as they are on all projects, and I think particularly in physical accessibility stuff . . . that's just become part of what we do when we

> design stuff—the first question is whether it's accessible physically. I wouldn't say we're as good about doing things that have fuzzier guidelines like reading comprehension and even graphic design stuff. (Exhibits professional, LSM)

Such statements are consistent with the experiences of people with disabilities who visit LSM in wheelchairs, who report that the Museum and its exhibits are largely accessible for them.

There are other practices and ideas that extend across projects when it comes to thinking about accessibility and the inclusion of people with disabilities that may not be as overtly obvious to visitors. One practice staff members mention is thinking about the inclusion of people with disabilities "at the beginning of a project." Here again there is alignment with how Oscar discusses the work of the Exhibits department. One Exhibit professional mentions that each project starts with the question "what are our accessibility goals and how are we gonna meet those?" This practice is evident not only in Exhibit staff member comments, but also in observations of team meetings (such as the meeting described above) and in statements made by individuals who work in other departments within the Museum:

> It's the same old story. You can either do it right the first time and start with the design phase and the prototyping and the actual building or you can pay a lot more on the tail end several years potentially down the road. And the biggest thing is to have the exhibit designers, prototypers, and the

> people who build . . . thinking about this right from the get-go. (Facilities professional, LSM)

Beyond shared practices, staff members in the Exhibits department also share common views related to the inclusion of people with disabilities. One common sentiment staff members share is that "by making [exhibits] better for someone with a particular disability then we make it better for everybody" (Exhibits professional, LSM). Some staff members report that this is a notion that they have come to learn over time through their work:

> I think once you do the work, once it's required, you go, "Yeah, well not only is this required, it's required for a very good reason." And you work with people, see them use the things you're planning, the exhibits you're planning and realize that it doesn't take that much more work to turn an exhibit in the direction that makes it usable by—well all, I guess, would be the hope—but certainly more visitors than what it would if you hadn't considered an audience with disabilities. And then once you have your eyes opened, it's pretty hard to close your eyes again. (Exhibits professional, LSM)

Another Exhibits professional expresses a similar sentiment:

> Well the statement that a lot of people say like, "If we make things accessible, it's better for everybody." I would say early on, I was probably fairly skeptical about that, but you know, I've learned that that's more or less true. Particularly in a place like this where we make a lot of

> assumptions about what visitors are coming with in terms of prior knowledge, and making things clear and easy on a billion different levels is good for everybody, there's no question about that. . . . Going through projects and doing that has certainly been something that I've learned. (Exhibits professional, LSM)

It is this idea of "better for everyone" that Exhibit department staff members connect to universal design. This connection is evident in statements such as ". . . the principles of universal design, it's not just for this special group of people who have a special way of being in the world," or ". . . the notion of universal design is one that we like and try to push on just to make things better for everybody by making them better for someone with a particular disability . . ."

Another commonly cited idea is the connection staff members make between the inclusion of people with disabilities and the inclusion of other audience as well. This connection is perhaps most apparent in the observations of two separate exhibit team meetings. During the meeting described above, one of the categories the team discusses is "Accessibility/language," implying that accessibility for people with disabilities and language access are linked together as the same challenge. In addition, observations of another exhibition team reveal that staff members discuss inclusion in very broad and open terms, connecting together the need to reach a broad range of audiences with the need to include people with disabilities. One staff member states during the meeting that the goal is to create an exhibition where "ALL visitors can be in environments where they are successful and see themselves as engineering practitioners, testers." The staff

members define “all” to include not only people with and without disabilities, but also girls and boys, English and Spanish-speaking audiences, and other groups traditionally underrepresented in engineering.

The exhibition projects that focus on the inclusion of people with disabilities generate not only learning that is manifested into shared practices and ideas, but also internal expertise and champions who serve to push the work forward in the future. There are a few individuals within the Exhibits department who are repeatedly named as champions for the inclusion of people with disabilities both within and outside their department, and many others who are cited as champions by fellow Exhibits staff members. In addition, observations of Exhibit team meetings show that there are multiple people who raise the topic of accessibility or inclusion of people with disabilities during these meetings. These individuals remind others to consider the impacts on accessibility of a particular decision they are making, advocate for inclusion as a goal, or make suggestions about how a particular design or idea could be made more inclusive of people with disabilities. Those who are cited or act as champions have served as key players for the exhibition projects that focused on accessibility and report that they learned about inclusive practices through their work at LSM—this is not expertise they bring to their work from an external position or experience.

Connections between inclusion in the Exhibits department and other LSM areas. Many of the themes that emerge in the story of the Exhibits department also resonate with themes that emerge in other areas of the Museum. Some of those themes are already discussed in the descriptions of Fred and Holly, Oscar, and/or the Courses and

Camps program above. These themes include the role that people with disabilities play in the work; the role champions play by bringing the discussion of inclusion to the forefront; the purposeful use of dialogue and discussion to advance the work; the learning that can be gained from working with other museums and organizations; the impact of professional development experiences on professional learning; the influence of ADA; the inconsistency that exists in the inclusive practices work of LSM; and the idea that professional learning is iterative, on-going, embedded in practice, and stems from a process of experimentation.

There are a few themes that appear more prominently in the description of the Exhibits department than in discussions of other areas. One such theme is the focus on "better for everyone." Multiple members of the Exhibits department members make explicit statements addressing this idea, yet this concept is infrequently mentioned as pertaining to work in other areas of the Museum (except in a few scenarios with the Courses and Camps program).

Another related concept, however, that of thinking of the inclusion of people with disabilities as being part of a larger effort to include a broad range of visitors, does appear in the discussions and thoughts of other Museum areas. For example, observations of a training for volunteers show that discussions surrounding ways to include visitors who are blind in interpretations are connected to discussions of how to include other audiences in interpretations. During the training, each group is given an object and a fictitious visitor group to think about, and a visitor who is blind is listed as one scenario amongst a host of others including a school group, a couple in their twenties on a date, a family

from East Africa, and a group of older adults (who were presumed to have some sensory and mobility limitations). The connection staff members make between the inclusion of people with disabilities and the need to serve a broad audience is perhaps not surprising given that a commitment to social justice is an identified aspect of LSM's culture.

Another point of emphasis by members of the Exhibits department is the importance of thinking about inclusion from the beginning of a project, which again, is a concept that is not expressed about the work in other areas of the Museum (although is expressed as being important by Oscar, who works closely with the Exhibits department). This might perhaps be an artifact of the process of exhibition production, which has a clearly defined beginning stage (idea brainstorming) and end stage (fabrication and installation). Other areas, such as programs, do not tend to have clear endings and beginnings.

The impact of the practices of other museums and how these other museums' practices work against inclusion of people with disabilities at LSM is not a topic that is discussed in earlier scenarios in this case, but it is something that affects other areas of LSM's work beyond that of the Exhibits department. In particular, although the LSM's film theater is equipped with rear window captioning and audio description capabilities, not all of the films produced for use in this theater (most of which are created by other film producers, such as other museums) enable the use of these capabilities:

> I know one thing that doesn't get used very often . . . we have small screens . . . in our [name] theater . . . for closed captioning. Great! We got closed captioning [capacity], but the . . . films need to be coded during

> production to take advantage of that close captioning and a lot of the . . . theater film producers just don't do that, it's another cost. . . . So we have the capability, but it generally does not get used because the films are not closed captioned. (Facilities professional, LSM)

Another topic that is raised in the discussion of the work of the Exhibits department that also appears in other areas of the Museum is the role that large, well-funded projects play in advancing the work toward inclusion at LSM. The result is that some of the inclusion efforts are what the President of the Museum calls "episodic noteworthy activities." Although such episodic activities happen more frequently in the Exhibits department than in other areas of the Museum (due in part to the more frequent occurrence of large, well-funded projects in Exhibits as compared to other areas of the Museum), other areas, such as facilities and the film theater, also made drastic improvements to accessibility during times of large, well-funded projects. This happened most significantly when the new building opened, which corresponded with a number of improvements related to the inclusion of people with disabilities. The new film theater was built with specific rows for wheelchair users that have plugs for electric wheelchairs; assistive listening devices for individuals who are hard of hearing; a captioning system; and a designated area for American Sign Language interpreters. The new building design features bigger bathrooms and accessible stalls, more elevators, better flow and navigation between areas, and the use of push button controls on all doors.

Although large, well-funded projects do seem to provide the opportunity for actions to be taken to make the Museum more inclusive of people with disabilities, such

projects do not always lead to improvements in inclusive practices. As noted above, a few recent large, well-funded projects did not involve extensive actions to make the environment more inclusive of people with disabilities. What appears to be important is that the large, well-funded project embeds accessibility as one of the stated project goals.

As noted above in the description of the work of the Exhibits department, a common action that is taken outside of large, well-funded projects is a focus on measurements in the physical design and access for people in wheelchairs. This is true of other areas of the Museum as well. The Facilities department pays close to attention to wheelchair access throughout the building ensuring that there is ample room for wheelchairs to negotiate the space and accessible restrooms, doors that activate and open using push buttons, and outdoor pathways that wheelchairs can easily traverse. Visitor Services professionals make sure that wheelchairs are provided for visitors who need them and work to ensure that there are comfortable spaces for wheelchairs in the large format film theater.

In summary, efforts toward the inclusion of people with disabilities by the Exhibits department have evolved and changed over time. The work of this department began over 20 years ago, and some professionals feel that ADA might have played a role in initiating the Museum's work in this area.

There are a number of efforts that correspond to changes in the professionals' practice, including professional development programs, group discussions about inclusion-related goals, large and well-funded projects, collaborations with external organizations, learning through experimentation, champions who push the work forward,

connections to a concern for the inclusion of a broad range of audiences, and working with people with disabilities. Similar efforts are observed in other areas of the organization as well. What holds the Exhibits department back appears to be the lack of application of what is known about inclusive practices to all projects undertaken by the department (which is again an attribute repeated elsewhere in LSM) and the lack of support for inclusion by other museums (a problem shared with the film theater).

What sets the Exhibits department apart, however, is a shared sentiment that creating experiences that are inclusive of people with disabilities creates an environment that is better for everyone, and that it is important to begin thinking about the inclusion of people with disabilities from the very beginning. These ideas (which are commonly expressed in conjunction with the concept of universal design) are ones that may be present, but certainly do not seem to be as prevalent, in other areas of the Museum.

Viewing Inclusion of People with Disabilities across the Lenses at LSM

Viewing practices related to the inclusion of people with disabilities at LSM across the four lenses provides a holistic view of what the change toward inclusion looks like at this large, multifaceted science museum. These lenses afford the ability to identify areas where changes have and have not taken place related to the inclusion of people with disabilities within the organization, which in turn helps to identify the kinds of processes and contexts that facilitate, detract, or impede changes that make the Museum more inclusive of people with disabilities.

Looking across the four lenses reveals that change has occurred and is occurring in this museum related to the inclusion of people with disabilities as the organization

learns and adopts new practices over time. Such practices include a focus on accessibility and accommodations for wheelchair users (such as attention to the heights of the interactives, push buttons on doors, elevators, ramps, free wheelchairs for guests, amongst other accommodations), a regular practice of making specific accommodations for children with disabilities who participate in the Courses and Camps program, providing financial assistance for tickets or membership when needed, offering multisensory and hands-on exhibitions, affording visitors with multiple places to sit and rest, and embedding inclusion into the design of its educational programs (such as making connections between special education and teacher professional development and modifying theatrical programs).

The lenses of the Courses and Camps program as well as the Exhibits department yield insights on the processes of change that lead to the actions cited above. Across both of these areas (which are two areas within the organization where some of the more significant changes are taking place), staff members report that they see the change toward the inclusion of people with disabilities as being an on-going process. In the Exhibits area, in particular, the change is viewed as episodic and not linear or consistent over time. There are also similarities in the way they discuss how the change has emerged; through a process that features learning through practice, experimentation, and the involvement of people with disabilities. In both of these areas, staff members also state that professional development offerings, partnering with other organizations, learning from the work of others, and dialogue also play a role in pushing the work forward.

From these change processes, internal experts and champions have formed in both the Courses and Camps and Exhibits areas. These champions contribute to the on-going change by continuing to advocate for and provide expertise related to the inclusion of people with disabilities in the organization.

There are also a number of behind-the-scenes practices the Museum routinely employs. As demonstrated most clearly in the description of Oscar's experiences above, people with disabilities are regularly involved in the work of the Museum. In addition, as discussed in the lens of the Courses and Camps program (and again mentioned in the lens of Exhibits), the Museum offers occasional professional development experiences for staff members, interns, and volunteers that address the topic of inclusion. These behind-the-scenes practices align with the processes cited above that promote on-going change toward greater inclusion of people with disabilities. In this way, these practices are both actions taken by the organization to be more inclusive, and the way that the organization learns to be more inclusive.

There are other areas, however, where there are inconsistencies in the practices employed, which suggests that the change has not become integrated into the normal practices of all organizational areas. The description of the Courses and Camps program reveals that the educators are not consistent in their implementation of certain practices (such as decreasing time for lectures and focusing more on hands-on activities) that are known to make these programs friendly to children who are on the autism spectrum. Similarly, the discussion of the work of the Exhibits department focuses on a lack of application of certain practices (including audio labels, accessible fonts, tactile elements,

etc.) across all exhibition projects. The experiences of visitors with disabilities confirms that presence of multiple inconsistent practices, such as the inconsistencies in how staff members treat and work with people with disabilities, the cleanliness of the facilities, wayfinding, captioning, the ease of use and understanding of exhibition content, provision of American Sign Language services, amongst others.

The reason for some of the inconsistency in practices is revealed in how staff members describe the challenge that impedes the organization from being more inclusive of people with disabilities: communication. They report that greater communication is needed with the local disability communities about the practices and accommodations they offer. They feel more communication and sharing is needed across organizational levels about the importance of this work to the Museum. Staff members in both the Courses and Camps and the Exhibits departments also believe that greater communication is needed internally about what they know to be best practices related to the inclusion of people with disabilities, and that the absence of such communication is contributing to the inconsistencies that appear in their inclusion work. As described above, communication between departments has been an on-going issue at LSM and is one of the factors that prompted the recent change to the organizational structure. It is not surprising, therefore, that communication difficulties seem to be preventing LSM from being more inclusive of people with disabilities.

Beyond changes in practice, there are also changes in how staff members have come to view inclusive practices over time. The cross-lens perspective demonstrates that different parts of the organization think differently about inclusion. As described in the

lens of the Exhibits department, staff members in this area view practices that are inclusive of people with disabilities as being "better for everyone" and state that they employ a universal design approach when making their exhibits more inclusive. They and others in the organization also tie the inclusion of people with disabilities to the work of including other underrepresented audiences in the Museum's science learning offerings. This connection is not surprising given the importance LSM places on issues of social justice and science education. Exhibits professionals also see an emphasis on the inclusion of people with disabilities as something that needs to be addressed at the very beginning of the project. In contrast, although there are some aspects of the work of the Courses and Camps program where staff members have come to adopt a "better for everyone" stance, staff members working in this program largely demonstrate that they view inclusion from an accommodations lens, focusing on customizing the program and making supports available that are tailored to each individual child with a disability.

The difference in how the work of inclusion is viewed across these two areas of the organization may partially (but perhaps not fully) explain the discrepancy between how staff members in other areas of the organization react to the inclusive practices in Exhibits versus Courses and Camps. As the lens of the Courses and Camps program makes clear, there are individuals within the Museum who see the need to limit the extent to which accommodations are made for people with disabilities within this program. They believe there needs to be a "line" drawn with regards to how far the organization is willing to go to make the program inclusive of children with disabilities. In contrast, none of the staff members in the Museum report seeing such a need for the work of Exhibits.

Beyond change processes, there are also elements of the context that appears to affect LSM's change toward inclusion. As Oscar reveals, there are factors related to the city and its governance that in turn affect inclusion at LSM. Similarly, the external context of the broader museum field, where inclusive practices are not the norm, negatively impact the change toward inclusion at LSM. Conversely, the presence of ADA appears to lead to changes in practices that make the Museum more inclusive of people with disabilities. Although these contextual factors are outside of the realm of direct control for LSM, they do play a role.

This case description provides a window into understanding how one museum operating in a particular context, the Large Science Museum, has taken actions to be more inclusive of people with disabilities. This organization has a large staff and budget, is highly collaborative with other organizations (especially museums), has an international scope and reach, and is located in an urban environment. This context is somewhat different from that of OEM, which is a smaller, regional museum that is located in a suburban community. Yet in some ways, the practices of inclusion, as well as the processes and contexts that facilitate or impede them are similar. Do some of these same ideas ring true for a medium-sized science museum that is located in an urban and highly diverse community? The next case description bears some insights into this question.

Chapter 6: Urban Community Museum (UCM)

This case description depicts the work toward inclusion of a moderately-sized museum, the Urban Community Museum (UCM). The case begins with a sketch of the overall context of the organization. It continues by discussing the inclusion of people with disabilities at this site, looking through the perspective of four different lenses: the reactions of visitors with disabilities to the Museum; the experiences of two staff members with disabilities who work at the Museum; the work of one particular program (the On-the-Floor Educators) that is officially thought of as the area that promotes diversity and inclusion within the Museum; and the history of work related to exhibition practices that are inclusive of people with disabilities. The case ends with a holistic summary that describes what can be learned about change toward inclusion of people with disabilities at UCM by looking collectively through all of the lenses.

Context

The Urban Community Museum (UCM) is a mid-sized museum located in an urban area of a major metropolitan city. With an operating budget of over $15 million, approximately 500,000 visitors a year, and 280 full-time, part-time, and casual employees, UCM is smaller than the Large Science Museum (LSM) and bigger than the Outdoor and Explore Museum (OEM). However, with only approximately 120,000 square feet of indoor/outdoor exhibits space, it is the smallest of the three museums in this regard. Similar to LSM and OEM, its visitors are mostly school groups and family groups, with less of an emphasis on adult-only groups than can be found in the other two museums.

UCM is located within a city-owned building on city-owned property. This creates a different dynamic between the city and the Museum than exists in the other two museums, both of which receive funds from the city but are non-government, non-profit institutions. Similar to the other museums, however, UCM is funded through a variety of sources, including federal grants, city funds, private or corporate donations, and foundations.

UCM's building is relatively new, but the oldest sections predate the Americans with Disabilities Act (ADA). A new wing has been added since the enactment of ADA, and this wing features many new exhibitions, a large elevator, and staff spaces. Similar to the other two sites, UCM's exhibition space features interactive and hands-on exhibit components, such as those found within most other science museums. In addition, UCM offers extensive outdoor exhibitions that feature a play-oriented theme. The theme of learning through play can also be detected in the descriptions of new indoor exhibitions that are currently under development.

UCM is undergoing extensive change. A new CEO has recently been hired, a reorganization is underway[10], a Human Resources department is being added to the organization (the first in its history), and a new initiative has been launched to create a stronger link between UCM and its local school district. In addition, close to a third of the staff members are new to the organization. Similar to LSM, the reorganization intends to encourage collaboration across the Museum and "decentralize responsibility" (Senior

[10] Due to this reorganization, titles, departments, and positions changed during the course of the study. For the purposes of this study, the organizational area identified with an individual is where the individual was working at the start of the study as this was the area where that individual often had the most experience.

Leader, UCM). According to a Senior Leader, the rationale behind some of the changes is "more people thinking about how to solve a problem is better than fewer."

While there is a renewed emphasis on internal collaborations, external collaborations have always featured prominently in the work of UCM. Many existing partnerships exist between UCM and universities. In addition, UCM is working to build a stronger relationship with the local board of education. Multiple non-profit organizations, especially those in the surrounding community, also have existing partnerships with UCM. This organization, similar to LSM and OEM, also collaborates extensively with other science museums. It belongs to multiple national museum networks, senior staff members play key roles in industry organizations, and it collaborates with other museums when building new exhibitions.

Although UCM has a national reputation as a leader in the science museum field, it is in many ways a local museum. Great emphasis is placed on reaching and serving its local community. According to its annual report, close to 75 percent of its visitors are from the city where the Museum is located, and roughly a third come from the immediate surrounding area.

UCM staff members take great pride in the cultural and ethnic diversity of the surrounding community, noting how it "is actually the most ethnically diverse county in the whole of the United States" (Education professional, UCM). Staff members remark on the sheer number of languages spoken within the local area by noting that "within a five miles radius of the institution there are over 100 different languages spoken" (Senior Leader, UCM). They also comment on the variety of cultural and ethnic groups that lives

nearby, for instance, “There’s a very large Hispanic community, Indian community, Chinese community surrounding us” (Education professional, UCM). To better attract the local community, UCM purposefully hosts a few free hours each weekend and during the week. They also serve as the site for community events and cultural celebrations and as a gathering place for community members. One staff member describes the relationship with the community as follows:

> We’re incredibly diverse . . . our footprint is amazing . . . [this area] is diverse more than any other place in the United States. . . . Within 10 blocks of every direction you’re gonna literally just see so many different cultures . . . occasionally [when] you walk through the parking lot, you might walk by . . . players from the local community playing volleyball in our parking lot. . . . You’ll notice we don’t ever get . . . graffiti. . . . No one really does anything to us . . . I think it’s kind of a sign from the community that they . . . get what we’re about, that we’re a science museum and . . . we’re not here to impose on them. . . . When we do big days in the community, like . . . Columbian day or Cinco de Mayo . . . they will come in and they will experience [the Museum]. I know that our Education department tries to . . . give [people that live within the zip code] free access and stuff like that. And I think that especially for our outlying community, they see museums from where they come from, museums are for the elite, and then when they come in and see people playing with foam bricks, and they see people throwing pitching balls,

> they're like, "Wait a second, this is stuff that I can totally do. What are we doing? . . . This isn't scary, this isn't elitist." (Visitor Services professional, UCM)

Some staff members feel that because of where the Museum sits, "the whole issue of inclusiveness is very much in the DNA of this place" and that staff members think "broadly and inclusively about strategies for engagement in STEM learning" (Senior Leader, UCM). Staff members feel there is a "concerted effort [to reach] the people of the local community and a desire to help them feel comfortable in the building" (Educational professional, UCM). The emphasis on diversity and inclusion is evident not just in how staff members work with visitors, but also in the organization's hiring practices. The staff is quite diverse, and observations of multiple team or department meetings demonstrate that staff members of a white, non-Hispanic background are not always the majority.

Understanding the context of UCM—a medium-sized organization that exists in a culturally-diverse and urban area, has numerous external collaborations, is community-focused and highly values diversity—provides a backdrop for understanding the work and change toward the inclusion of people with disabilities at this organization. To gain further insights on this organization and its change toward more inclusive practices, a variety of lenses are used to look at the organization from different vantage points.

Viewing Inclusion through the Lens of Neil's, Ben's, Mark's and Cindy's Experiences at UCM

Neil and Ben, and Mark and Cindy represent two different families. Neil is a 19 year-old wheelchair user who visits UCM on this occasion with his father, Ben. Both Neil

and Ben have not visited UCM frequently in the past, although Neil has recently been involved with UCM as an advisor for a new traveling exhibition that discusses the topic of disability. Mark and Cindy are parents of two children, a boy and a girl, who join them for this visit.[11] Their eldest child and daughter, Ramona, is on the autism spectrum. Mark and Cindy are also not frequent visitors to UCM, although they do visit a variety of science and children's museums on a regular basis.

The group visit, which includes both families, begins in a conference room at UCM. Neil and Ben arrive first, and they discuss Neil's experience as an advisor for the new exhibition briefly before Mark and Cindy arrive. Neil expresses that his experience as an advisor has been very positive, stating that this experience is part of the reason he decided to participate in this research study as he finds it is "nice to get my ideas out."

Mark and Cindy arrive with their two children a few minutes into the conversation. Ramona immediately runs over to the phone in the conference room, picks up the receiver, and then runs around the room while still holding it. Cindy pulls Ramona toward her in a hug, hangs up the phone, and sits with her arms around Ramona while the group continues its discussion. Mark informs the group that he heard about this opportunity during a panel on autism that had recently been held at the Museum. He states that his family's favorite aspects of UCM are the preschool area and another area that features many hands-on exhibit components. Mark then describes Museum areas that he thinks are particularly unwelcoming for Ramona and his son:

[11] Although both of the children attended the Museum with their parents for this study, these children were not interviewed or audio recorded (only observed) as a part of this research study.

> Upstairs seems like it's some exhibits for the older children . . . that are difficult for younger kids to understand and approach, especially like my daughter, Ramona. And also the playground outside, which I know everybody else likes very much. But . . . they have things with water in the summer that are too difficult for the kids to be able to operate. They have a screw with water coming up. They like seeing water coming up, but they can't really do it. It's not accessible. I guess in general, as you can see, she's very much into computers. This museum doesn't have many displays that have a screen to press or interact with. It's a little different than some other museums we've been to.

When comparing UCM to other museums, Mark's and Cindy's reactions are mixed:

> Mark: There [are] two categories. All other museums, I'd say it would probably be above average. In terms of museums we've been to, [name of another regional science museum] and we've been to other science museums like the [name of science museum outside the region], I'd say it's below those because those were more fun, more accessible. The [regional children's museum] has a lot of fun parts that they really like . . . Cindy**:** They had the different instruments, the drums, so the kids can hear the sounds that the different instruments make. All kinds of instruments, there were very many different kinds; it was really interesting they could introduce kids to sound and music.

> Mark: They had like an open van that showed the accessible van . . . which was nice for them, there were a lot of other things there, a lot of concepts they made easier for them to get.

Mark further describes other problems his children have when visiting UCM:

> Some of the exhibits, even just the stuff that they have to push and pull, are even higher, too tall for them . . . they're not eye level. They can't see whatever's there and obviously things like probabilities, statistics are much too difficult concepts.

Neil agrees that the local children's museum is "a lot better at that level."

The group decides that their first stop will be the preschool area, as this is one area where Ramona and her brother will be the most comfortable. Neil will look at this area from the perspective of an adult in a wheelchair who might be accompanying a young child to this exhibition. On the way to the preschool area, the group passes through an exhibition connected to the topic of exploration. Both the preschool area and the exploration exhibition are part of UCM's new wing.

As the group walks through the exploration exhibition, Neil notes that most of the exhibit components are at a height that he can easily reach. There are a few, however, that are challenging for him to use. For example, Neil is not able to look into the microscope at one exhibit component. While the table is at the correct height, the microscope eye pieces are too high, and there is a box underneath the table that prevents Neil from fully pulling up under it. At another exhibit component, a case containing objects is set too high and Neil cannot look into it, even when he raises his wheelchair. At

yet another exhibit component, Neil can manipulate and operate the controls of the interactive, but he can't see through the window that shows him what the controls are doing.

While Neil uses the exhibit components and discusses some of the problems he notices, Mark and Cindy work to keep Ramona and her brother's attention. While her brother attends to various videos in the space, Ramona crawls all over the exhibition—sitting underneath one exhibit component and squeezing between two others. At one point, Ramona sprints down the corridor toward a staircase at top speed, and Cindy runs after her. Mark and Cindy report that spacious exhibition areas that have clear boundaries are easiest for them as then Ramona can run around at will and they can easily track her. This exhibition area is a little difficult for them as there are no clear boundaries so Ramona can run quickly away from the rest of the family, and there are many partitions that Ramona can hide behind.

The group eventually leaves the exploration exhibition and arrives together at the door of the preschool area. There is a cart blocking the doorway that is used to check-in visitors and control the guests who are allowed to enter (only young children can attend this exhibition). After noting the ages and number of people in the group, the staff member working the cart pushes it to the side so that most members in the group can enter, but she does not leave enough room for Neil to pass by in his wheelchair. Another group member asks her if she could move the cart further so that he can enter and she does so.

Once inside, Ramona and her brother immediately flock to the grocery area. She plays with the other children in the area as they jointly work the conveyor belt that is part of the grocery story check out area. Ramona flaps her arms as she and her brother load the fruits and vegetables on and off the conveyor belt. Mark and Cindy stand back and watch their children. Mark states that because the exhibition is "enclosed" they are "a little bit more relaxed." Mark and Cindy go on to further describe why this area works well for their daughter:

> Cindy: [Children with autism] don't think about moving with mommy or daddy, they just go where they want to go. They don't understand. The other thing that I also like is the fruit and the vegetables and the food, these are real things. It kind of teaches kids about . . . conveyor belts, things that they already see when they go with their parents to the store. So it's something familiar, which is really nice and it's on a level that they can play with it . . .
>
> Mark: It's very interactive too. It forces them to work with other kids. . . . They can touch everything. There's nothing that's dangerous or off limits.
>
> Cindy: It's nice to have . . . little enclosed areas for kids like our daughter because we don't have to worry as much. We don't have to have . . . a panic attack! "Where is she?"
>
> Mark: You can tell with her, I don't know if you've noticed, but she does flap her arms when she's very excited . . . Then this is exciting to her, even though she's getting a little old for this type of area.

While Ramona plays with her brother, Mark and Cindy take this opportunity to describe some of the safety concerns they have related to UCM's facilities:

> Cindy: She needs to be watched. When we just go through the Museum, one of us has to be around her because we don't know what she's doing or where she's gonna go. So that's the fear, there's always one of us looking after her . . . making sure she's not getting into dangerous situations or going to places that she shouldn't.
>
> Mark: I think also they don't realize as much about the exhibits versus what's not the exhibits . . . what can they touch or can't pick up. So [when] she saw the open door to the administrative offices, she [went] straight through that because she wanted . . . the telephone in the conference room. She doesn't distinguish between, "I can touch these foods because it's part of the exhibit, I can't touch that telephone." . . . When we came here, two things happened. It wasn't dangerous because there's no cars, but she walked straight across the street without us and . . . when we were at the reception area, she went right behind the desk and started playing with the credit card machine, typing in numbers.
>
> Cindy: Maybe if they have a little thing that says "Stop" because she . . . can read . . . the stop sign . . . if it says "Stop" so that means you can't go there. Something to say to kids, "Hey, that's not a place you can go."

While Ramona and her brother play at the make-believe grocery store, Neil is over at another conveyor belt activity, which lifts rocks up into the air and requires

collaboration— two children operating different pulley systems. One pulley can be activated from the floor, and the other from a raised platform. Neil "thinks it's pretty cool" because "it's a nice little team effort." Even though he can't go up to the platform, he can still interact with another person who is up there and he "can actually turn the wheel" while "someone else brings the elevator up."

There is another exhibit component in the gallery that Neil does not think is effective. It is also on a raised platform, but does not enable interaction between children on the floor and those on the platform. Therefore, he feels it is exclusionary. Overall, however, Neil thinks the height and reach of the exhibit components in this area are better than those in the exploration exhibition.

The group decides to move on to another exhibition. Ramona, however, is still engaged with the grocery store activity. Rick explains that to get Ramona to agree to leave they have to "get her apples, different things . . . promising her a treat or something else, that usually works."

As the group navigates through the Museum, Neil easily moves through the exhibition halls, seamlessly traveling along with the group. Even though the group is crossing over from the new wing to the old wing, the pathways are clear and wide, and slanted surfaces and ramps make it easy for Neil to move from one level to another, while still remaining with the group.

The next exhibition the group visits focuses on molecules. As Neil explores around, he calls out that here again he is not able to look through the microscopes. While

the table is at the correct height, the eye pieces are too high. Mark reports that his son is able to find an activity in this area that engages him, but Ramona cannot.

The group then moves on to an area that focuses on sound. Here, Neil easily uses many of the interactives, including one where he wheels himself underneath speakers that make different sounds based on his motion. Ramona's brother also enjoys this interactive, spinning under the speakers. Cindy and Ramona step away to another area.

While the others are in the sound exhibition, Cindy and Ramona sit together as they use a computer kiosk. Mark and Cindy describe Ramona as "calm" and "very into what is happening" at this computer station. While Ramona uses this computer station, I talk to Mark about the exhibit components in this surrounding area, which focus on light and color (a topic that is generally of interest to Ramona):

> [This area needs] better signage. . . . It's hard . . . for her being more visual than anything else. It's a lot of small letters and small things that makes it very difficult for her to understand. . . . It seems a little bit dark for her especially. She needs the bright colors, if she sees the bright colors she's attracted to it. . . . Probably if they painted the walls something bright . . . In the toddler area there was the pictures of the fruits on the wall and then she went directly to the fruits . . . A picture of what they're supposed to do would tell her what all this stuff is. They . . . don't really have a picture here of how you're supposed to do this exhibit. . . . It requires . . . an adult to read it. . . . For a little kid, if they just have a little graphic, [a] pictogram that would really help. Simple things, it's not very complex. I

> think a lot of things in the exhibits are very good but they could never understand . . . I think the easiest thing would just be if they could change the signage in here, small things. Put the little pictograms or something like that. That's very easy and not very expensive for them to build.

After this concluding thought, Mark and Cindy leave the Museum with their children.

Neil and Ben are still in the molecules exhibition. Neil reports that many of the stools in this area are in his way, making it difficult for him to move around the exhibition. At one station where visitors can build their own molecule, Neil points out that the pieces for this exhibit are located too far back and he can't reach them. He also points out another, older exhibition in the sound area where there is a bench nailed down in front of the exhibit component that prevents him from accessing the interactive. Other than these particular exhibit components, he reports that "everything else was pretty much fine."

Neil ends his visit by rating and commenting on the accessibility of the various areas he visited. He states that "the preschool area was probably around 7 or an 8 . . . [the molecule area] is like an 8.5 or 9." He further states that portions of the newer exploration exhibition were "a complete wipe out." Neil and Ben then leave the Museum.

Connections between Mark's, Cindy's, Neil's and Ben's experiences and other visitors with disabilities. The visiting experience of these two families at UCM connects in many ways to the experiences of the other participating visitors with disabilities (one woman who is Deaf and another who is the mother of multiple children who are on the autism spectrum), as well as participating staff members. Many of the

practices these four individuals call out as being effective for people with disabilities are also those that staff members mention as actions specifically taken to make the environment more inclusive. These practices include involving people with disabilities in the work (such as Neil serving as an advisor), the inclusion of disability-related content in programs and exhibitions (such as the program Mark and Cindy attended on autism), wide pathways and ramps that are accessible to individuals in wheelchairs, and a specific area for young children that is also accessible for children with intellectual disabilities (see Table 9).

There are other positive aspects of the Museum, however, that Mark, Cindy, Neil, and Ben do not mention during their visit, but other study participants who have disabilities do mention. A mother of multiple children who have autism cites that the provision of ample seating is an important part of what makes UCM a welcoming and comfortable environment for her children. Another adult visitor who is Deaf remarks on the ubiquitous presence of captions on all videos, which two staff members who are d/Deaf also call out as being exemplary.

There are still further items that staff members mention, but not visitors with disabilities. One practice, the provision of on-going professional development trainings for staff members related to disabilities, is a behind-the-scene practice that is not readily visible to visitors with disabilities. A few other practices, such as the hosting of virtual visits for homebound children and the willingness to make accommodations for children with disabilities who participate in sign-up programs, reach a limited and specific audience and, therefore, are not encountered by visitors who visit the Museum on any

given day. Still other practices, such as providing free wheelchairs for visitors who might need them or a stated policy for service animals, are those that are not relevant for the participating visitors with disabilities.

There are a few practices, however, staff members mentions but not visitors with disabilities without any obvious reason for why there might be a discrepancy. These practices include attention to safety for visitors with disabilities, the presence of large elevators that can fit multiple wheelchair users at once, the accessibility of drop-in programs, and reduced or free admissions on certain days and for certain individuals with disabilities.

As noted above, there are some inconsistencies in the experiences of Neil and Ben and Mark and Cindy. Neil calls out inconsistencies in wheelchair access to exhibition components, which some staff members also mention. Mark and Cindy notice that there is inconsistent use of interpretive images, which is something that a visitor who is Deaf and a mom with multiple children on the autism spectrum also notice. The visitor who is Deaf, in particular, thinks there are many places in the Museum that include strong visual images, but she wishes there were more. She is looking specifically for more visuals in the labels that communicate information, as well as more interpretive imagery in videos that can explain the concepts being presented. Mark and Cindy, as well as these other visitors and staff members, also agree that while the existing hands-on interactive experiences in the Museum are a plus, there is certainly room for exhibit components to become even more interactive and hands-on. The same is true for accessible technologies that are present on the Museum's floors. Although staff members are proud of the fact

that they've been able to innovate in this area, they also acknowledge that there are not many accessible technologies that are available to visitors who have disabilities during their visit.

In addition to visitors, staff members also call out areas where there are inconsistent practices. Staff members simultaneously talk with pride about the audio interpretation that was available in the past and with sadness or frustration that this form of interpretation is no longer available. The same sentiment is expressed about a prior wayfinding system that used to exist for visitors who are blind or have low vision.

While staff members acknowledge the need for and the loss of a wayfinding system for visitors who are blind, they do not mention wayfinding aids that are currently present for all visitors. The visitor who is Deaf and the mother of children with autism both mention how the wayfinding system in the Museum is very clear and easy to follow, with ample usage of signs and arrows that point them in the direction of the exhibitions they are looking for. This, however, is still yet another area of inconsistency as the mother of children with autism also points out that the wayfinding system could be further improved and enhanced through the use of visuals (such as footsteps) that point her children in certain directions. The visitor who is Deaf further mentions that the lobby is confusing and difficult to navigate.

There are a few additional areas where there are inconsistencies between the perception of staff members and visitors with regards to whether or not a specific practice is available for people with disabilities. One such practice relates to the presence of staff members who can assist visitors with disabilities. While staff members frequently cite

how people are present in the exhibition halls to assist visitors with disabilities and also report stories of actions they have taken to assist visitors with disabilities in the past, the participating people with disabilities neither encounter staff members who provide assistance nor mention frequent interactions with staff members. The mother of multiple children who are on the autism spectrum has had positive interactions with staff members in the past, but she wishes staff members were more available to her and her children during her visit.

Another related area of inconsistency is the provision of American Sign Language (ASL) interpretation. While staff members call out that many On-the-Floor Educators speak ASL (including two staff members who are d/Deaf), the participating visitor who is Deaf does not encounter anyone who does so and expresses that ASL interpretation is something that would greatly improve her experience at UCM.

Beyond areas of inconsistency, there are areas or attributes of the Museum that staff members and/or visitors with disabilities report as being largely problematic or inaccessible. One key area relates to transportation to and from the Museum. Staff members (including those with disabilities) report that it is very difficult to access UCM via public transportation, even though the Museum exists in a large metropolitan area with an extensive public transportation system. Similar to Mark and Cindy, other visitors also report that parking is difficult, as there is a large stretch of outdoor space between the parking lot and the Museum's entrance.

Many of the other areas that staff and visitors mention as inaccessible also connect to Mark and Cindy's experience. These include the lack of facilities and

exhibitions that are accessible to visitors with intellectual disabilities, exhibit graphics and labels that are dense with text and use small fonts, lack of attention to the ability for parents to monitor their children with intellectual disabilities, and restrictions that exist with regards to eating food in the Museum's exhibit halls (the last two items are those that visitors mention, but not staff).

Another area for improvement that is mentioned by both staff members and visitors with disabilities (but not Mark and Cindy or Neil and Ben) is the need for greater communication with people with disabilities about the accessibility features that are available at UCM. For example, as mentioned above, the participating visitor who is Deaf wishes she knew if ASL interpretation is available, and staff members who are d/Deaf express frustration that their services are not promoted more to visitors. The same is true of audio interpretation and other services.

One area where staff members feel further work is needed that is not mentioned by visitors with disabilities is the need for more special events at the Museum, or special times when only visitors with certain disabilities could attend. This is a strategy for inclusion that staff members have witnessed at other museums that they think would be a positive museum experience for visitors with disabilities. It is unclear why participating visitors with disabilities do not mention this as an option for the Museum to explore. It could be that they are not aware of this practice or that this is not an experience they are seeking. One final area of concern for staff members that is not mentioned by visitors with disabilities is the lack of attention to the maintenance of some of the Museum's accessible offerings, especially accessible technologies.

Overall, Mark's, Cindy's, Neil's and Ben's experiences provide descriptive insights from the visitor perspective about the actions taken or not taken by UCM to make the experience more inclusive of visitors with disabilities. This description, however, only tells part of the story and does not address what the experience is like for the volunteers and staff members who work for UCM. To learn more about this aspect of the organization's inclusion work, the lens of Patty's and Abby's experiences can offer some illumination.

Table 9

Actions Taken/Not Taken to Make UCM More Inclusive of People with Disabilities

Actions Taken	Inconsistent Actions	Actions Not Taken
• Level pathways /ramps • Ample seating • Elevators • Captioning • Attention to safety • Free wheelchairs and strollers • Policy for service animals • Asking parents about children's needs for sign-up programs • Staff professional development • Involving people with disabilities in the work • Virtual visits for homebound children • Disability-related content • Reduced or free admission • Designated young child areas • Accessibility of drop-in programs	• American Sign Language interpretation • Attention to exhibition measurements • Helpful staff • Multisensory interactives • Audio interpretation • Accessible technologies • Interpretive images • Wayfinding aids	• Transportation • Communication with visitors with disabilities • Special events for visitors with disabilities • Labels with high contrast, easy to read fonts • Availability of food and drink • Inclusion of intellectual disabilities • Maintenance of accessible exhibits • Parents ability to monitor children

Viewing Inclusion through the Lens of Abby and Patty as Museum Staff Members

Abby and Patty are both part-time On-the-Floor Educators at UCM who are d/Deaf. Abby has been working at UCM for over four years, and Patty has only worked at the Museum for a year or two. Patty began working at UCM based on Abby's recommendation. Abby's start at the Museum was somewhat serendipitous:

> I was initially a visitor and . . . I was coming with my boyfriend and he was signing everything for me about what was going on, what we were seeing in the museum. At the time, I was searching for work, but had only just come here just to have a good time, to see the exhibits. Then somebody from the Educational department . . . happened to see my boyfriend signing to me. And they asked him if he wanted to work and he said, "Well no, but my girlfriend does!" [laughing] So I started talking and said, "Yeah, I want the job! But of course I don't know what I'm supposed to do!" but . . . I was interested. That is when I started, I met [name of supervisor] and so she started signing to me and I went, "Oh! Wow, I felt much better now because my boss was signing, so I felt more comfortable." And she's really encouraged me, "You could work here! We *need* someone who could sign . . . we always have deaf visitors." So clearly I accepted and . . . they hired me!

Similar to the other On-the-Floor Educators, Abby and Patty spend most of their time in the exhibition halls. Their responsibilities include interpreting exhibit components for visitors who happen to drop-by and performing scheduled science presentations for

visitors in designated demonstration areas. Abby and Patty use a variety of strategies to communicate with hearing visitors whom they encounter as a part of their work. While Abby both lip reads and signs, Patty mostly signs (with limited lip reading). Both Abby and Patty carry notebooks in their pockets to communicate with visitors in written form.

Observations of Abby interacting with a hearing visitor in one of the exhibitions show that her methods of communication extend beyond the verbal and written form and also include a great deal of body language and the use of the exhibit components as props. When instructing a young girl about how to use an exhibit component that involves sniffing a meteorite, Abby first tries verbally instructing the girl to sniff, but unfortunately the girl doesn't understand what to do. Abby then points to her nose and tells her to sniff, and again the girl doesn't respond. Finally, Abby sniffs the meteorite herself, and the girl then follows Abby's action. The interaction is eventually a success.

In addition to the responsibilities Abby and Patty share with other On-the-Floor Educators, they also have a role as educators who specifically serve visitors who are d/Deaf. It is this aspect of the work that Abby and Patty see as their primary purpose in the Museum. Abby states that her "goal" is to "make sure that [visitors who are d/Deaf] come." Patty concurs and further states that "the whole idea for us was just . . . to make [d/Deaf] visitors feel welcome and comfortable when they come to the Museum." Furthermore, it is this aspect of the work that they find the most rewarding. As Abby states, "when I'm with a deaf group I'm teaching them something that makes them feel comfortable, [and] I feel good."

Abby and Patty feel they have tangible evidence that they've been able to achieve these goals as visitors who are d/Deaf appreciate having an educator they can talk to. As Abby states,

> Sometimes when a deaf person just . . . shows up . . . out of the blue and they have a son or a daughter who comes with them . . . and they sign, if I'm working on the same floor with them or their area, I'll definitely come to them and say, "Oh! Do you need help?" and they're so happy to see [me].

She also feels that her presence has encouraged more d/Deaf visitors to attend the UCM:

> In my experience, when I first started here, we didn't have a lot of deaf schools coming here. . . . . When they saw . . . that it was more accessible because I sign and I can communicate with them, then we started to see more of the deaf schools coming. And then they [would say], "Oh! Yeah, yeah! I remember Abby! We want Abby!" And so they would reserve their program time and they would request me. And that was actually quite frequently, sometimes they'd say, "Is Abby still there?" or "I heard somebody [is] working there, a deaf person…?" and they'd say, "Oh yeah, yeah, yeah! C'mon! She's still here!" And when they would come, I would work with them. . . . When they see signing and I'm signing, everybody is . . . so much more comfortable, but at the same time, through my signing I am teaching them.

Others in the On-the-Floor Educator program similarly report that schools for children who are d/Deaf know about Abby and Patty and will request their services when they visit:

> I know every so often we'll have a school that will come in, but often times they'll bring a deaf interpreter or they'll ask us to provide, "oh you had that [educator] here that day. It'd be great if they could help us out again." So if we know that a school like [local school for the d/Deaf] were to come and visit, often times they'll tell us and then [the person] who runs our reservation will contact me and say, "hey, that [educator], do you think we can make her available on this day?" We'll contact her and we'll try and make it happen. (On-the-Floor Educator, UCM)

Observations of Abby and Patty capture them leading such a school group through the Museum. When the school group arrives, Abby and Patty immediately greet the group in the lobby. They then assist with the coat check, acquire storage bins for them to use, and direct them to the bathrooms and cafeteria. After the group is settled, Abby and Patty walk the school children and their teachers through the Museum, interpreting in American Sign Language along the way. Abby and Patty engage the children in various activities in different exhibition areas, such as creating giant bubbles and constructing models of molecules. At the end of the school group's visit, Abby leads a stage demonstration entirely in ASL and English for the group. This demonstration, which features the dissection of a cow's eye, holds the attention of all the children in the group who are smiling, laughing, and enthusiastically raising their hands during Abby's

presentation. Hearing visitors stop by and watch the demonstration as well and similarly appear to enjoy their experience.

Although Patty and Abby feel that the experience of visitors who are d/Deaf or hard of hearing is enhanced through their interpretation, they also feel that the Museum provides exhibitions that are "a little bit better than other" museums due to video "that explains all the different things." Patty notes that other museums "may be fancier but don't seem to be able to afford closed captions. Here we have that and it really makes a difference."

Not only do Patty and Abby feel positively about the exhibitions, they also generally report positive interactions with other staff members at UCM, reporting that their peers and supervisors are largely supportive of them and learn from working with them as well:

> Abby: I love working in this museum, I have nothing negative. The people who work here, I love them. They make me so comfortable . . . they are willing to learn sign, they're willing to figure out how to work with me, they're willing to communicate with me and with Patty . . . it's wonderful . . . I'm very lucky to work here . . . So when I first started here . . . they didn't know what to do with me! "Oh! What do I do?" . . . I told them, "You can talk to me!" . . . I have to also teach them as well how to work with a deaf person. . . . If I ever ask them at any point, "Would you mind making a call for me? Or calling to another department?" or whatever my

needs are, they're like "Oh fine!" . . . They're very willing to do so. They really are very flexible and they make the job easier.

Patty: That's why I like the Museum . . . so I have worked in other museums or other places where it was maybe one sort of, "race specific" whether it'd be Muslim, Jewish, or White museum or whatever, but here . . . we have greater diversity, greater variety, so I don't see just [one] specific race or a group of people. It's . . . great because [I] also see deaf people as well . . . it's just lovely.

Members of the On-the-Floor Educator program similarly report a positive working relationship with Abby and Patty and feel they have benefited personally by working with them. As one of the Leaders of the On-the-Floor Educator program states, "[Abby and Patty push] me to learn things that I never learned before . . . I'm so lucky that Abby is here, because if not, the sign language skills that I built would've . . . gone out the window." One of the Supervisors for the program concurs with this perspective:

> Abby teaches me new stuff all the time. She gave me a name sign, she teaches us how to sign words and things like that . . . also . . . we've talked about [how] her school life is sometimes a little different, but not anything crazy. . . . So [names of two other educators] have learned American Sign Language through meeting Abby and getting to know her. And I think what I've learned from Abby also is to be more mindful of how frustrated people can be when put in situations that they're not comfortable with.

While Patty, Abby, and other members of the On-the-Floor Educator program all report that the experience has been largely positive, it does not mean it hasn't been difficult at times. Both Abby and Patty have needed to adapt their communication style so that they are able to successfully interact with hearing visitors:

> Abby: When we have regular visitors come, boy it's tough! Because even though I have hearing aids, I'm struggling to hear them! . . . It's so loud, it's really tough for me and I try to lip read . . . I have to depend on other people at that point and maybe that's a bit bad because I hate depending on anybody, that's just not my style. But sometimes I have to say to somebody, "I don't understand what they just said. Can you help me out?"
>
> Patty: That's why I always have my notepad with me, I always bring that in case somebody comes up to me and says "I don't understand . . ." Or I look at them and I can't lip read, they're speaking too fast or whatever.

Abby especially has been frustrated over the years. She feels that, at times, she has been overlooked for a promotion because she is d/Deaf:

> Since I have been working for here . . . I've been doing everything that I'm required to do, but I don't see anything that happens to me . . . regarding promotions. . . . When I started with those people they're already promoted to a different program, and I'm still in the same place . . . I'm doing so much stuff, [and] . . . I want to try some other things, and I feel like I'm a little bit blocked or prevented from trying what I want to do in order to be promoted . . . I feel like I'm being pushed aside . . . I want

> that chance to become a floor captain but they tell me we need to have the radio and I tell them that I don't need to have a radio. I could figure out how to run the floor without having a radio . . . I feel like they should be a little bit . . . more fair. Patty wants an opportunity, I want an opportunity. We should be able to have that as well as the other staff, but I just feel that I'm constantly blocked . . . from that *ability* to improve my skills and to keep being promoted to different areas of the Museum. . . . It seems like I'm stuck! They're not allowing me to do stuff, so I feel like I am pigeon-holed. And I've complained very many times during these 4.5 years, but still, there's been no change.

Supervisors and Leaders of the On-the-Floor Educator program recognize Abby's frustration, and similarly feel frustration of their own. They often have a hard time figuring out what Abby and Patty can and cannot do. As one Supervisor of the program states,

> There's some post in the Museum that I push Abby to be in sometimes and she comes back very, very upset . . . because of the volume of people or how loud it was and while she's able to be vocal, they can't hear her or understand her. And so I thought I was pushing her to grow or push her boundaries, but it just backfired and ended up with her not being . . . put in that position again. And it makes you feel really bad because I like pushing people, and I like to not let them get too comfortable with what they're doing all the time. . . . But with Abby and Patty, I'm very weary to

> do that because I don't want to upset them or I don't want to provide an environment that's not comfortable.

Another Programmatic Leader expresses similar concerns:

> Sometimes I struggle with . . . understanding [Abby's] situation . . . I feel like I don't know . . . all these things and I should know . . . what . . . her rights are . . . as an employee and what we're supposed to be able to provide . . . I just feel like . . . I don't know the difference between when she's not being a good employee and not doing what she's supposed to do, or and when she really needs support in some areas . . . I feel like . . . the On-the-Floor Educator leadership team really struggles with that. . . . There [are times when] I feel like maybe I'm allowing her to . . . get away with things that other educators wouldn't get away with. So it's just a struggle that I have . . . where to draw the line at times.

One support that the On-the-Floor Educator program struggles to provide is ASL interpretation for Abby and Patty. This is problematic during the weekly staff trainings. At first, one of the program's Leaders led the trainings in both English and ASL, as she is fluent in both languages. Over time, however, Abby, Patty, and this Leader shifted schedules, and they no longer work on the same day. Now, another individual in the program who speaks some ASL but does not feel fluent leads Abby and Patty through the trainings. This individual acknowledges that he is "struggling to sign to Patty and Abby during . . . trainings," and although they "get by" he is "not good enough to do a signing

of what everyone is saying at all times." Patty agrees that the trainings are not conducted in a way that is optimal for her by stating,

> I also think you have to request for an interpreter during training because [name of supervisor] . . . he's not really an interpreter but he signed for us, but sometimes he doesn't sign very clearly and it's hard for him to catch everything and so I don't have the clear meaning of what I'm hearing.

Abby agrees, and further feels it would be helpful to have an interpreter assist her with the stage demonstrations she leads for a hearing audience:

> Well [stage demonstrations are] the hard part for me because you really need a voice . . . when the hearing students come . . . I would like to have somebody voice for me . . . I can certainly sign and do all those demonstrations . . . but it would be nice to have somebody voice for me.

Perhaps the greatest disappointment for Abby and Patty is that they feel underutilized—they would like to contribute more, but they are not sure how. Abby wants to know why her "services aren't basically being used more often." She thinks her services are not being communicated to potential audiences:

> They don't seem to be recommending me or putting out the word . . . I would be happily willing to go and work with anybody from the Museum who came to visit and who was deaf . . . so maybe what they need to do is more advertising to the community so they can see that we're deaf or disabled friendly. . . I know that they have two of us here and they certainly could be able to request either one of us if a deaf visitor came,

but . . . I just don't think the publicity is out there or the signage or whatever is needed in order for [visitors who are d/Deaf] to know that that's a possibility . . .

In the end, both Patty and Abby see the benefits and drawbacks of working in their positions:

Abby: This job is very comfortable for me, I feel like people have been very accommodating, but again it's that issue of being able to be promoted that is still stuck in my craw. I don't feel like I'm really given that chance.

Patty: I am very comfortable . . . I have some people here who know sign. For me, it's really good. The only negative for me is a language barrier, that's what I feel is a negative, but I can try and be patient with that.

Connections between Abby's and Patty's experiences and other volunteers, staff members, or consultants with disabilities. Abby and Patty are just two amongst many people with disabilities who are intimately involved in the work of UCM. Other people with disabilities work at UCM as paid staff members, consultants, volunteers, and advisors. Similar to Abby and Patty, multiple individuals with disabilities have been or are currently employed by the On-the-Floor Educator program. There are other individuals with invisible disabilities, however, who work as paid staff members in other areas of the organization. In addition, teens and adults with intellectual disabilities have been working for years as volunteers in the Museum's cafeteria, and numerous individuals with disabilities have worked as paid advisors or consultants for specific UCM projects. More recently, a new practice is being tested where people with

disabilities are engaging in a participatory design process where they become actively involved in deciding upon the content and design of the exhibition through design retreats. Neil, the visitor who is a wheelchair user, is one of these individuals.

In many ways, Abby's and Patty's experiences resonate with those of other individuals who have disabilities who are involved in the work. Similar to how staff members feel about the involvement of Abby and Patty in the work of the Museum, staff members also report that visitors benefit from the involvement of other people with disabilities in their work. The perceived benefits for visitors with disabilities of involving people with disabilities in the work connects directly with the Museum's overall philosophy that "having a staff that looked like the population" (former Senior Leader, UCM) one wishes to reach is a key way to make that population feel more welcome and included. In addition, some staff members also feel that the inclusion of people with disabilities in the work also benefits visitors without disabilities as it provides them with opportunities to interact with individuals with different lived experiences with whom they may not usually connect:

> [We] have a group of developmentally disabled adults as volunteers in our cafeteria. I think that is important for school groups to come and see that there is a wide range of the human experience, and [they] may become more comfortable because I don't know that they are necessarily exposed to people with disabilities on a daily basis. (Development professional, UCM)

Staff members also feel that they benefit from working with other people with disabilities, just as they do by working with Abby and Patty. This is true whether people with disabilities serve as volunteers, consultants, or paid staff members. One On-the-Floor Educator reports that by working with an individual who is a wheelchair user he developed an "understanding [of] everything that she went through" just to commute to work, which was "eye-opening." Another Exhibits professional describes how working with people with disabilities through a design retreat has led the exhibition team to be "painstakingly thoughtful about how we can include others." Still another Education professional states that working with people with disabilities at UCM has profoundly influenced her thinking about disability:

> I was definitely one of those people that would get a little more alert around people with disabilities because I was so afraid of offending them, and so bringing that into my work I continued to harbor those apprehensions and talking with [a consultant who is blind] and just being part of these different conversations . . . I learned from them . . . they really don't want to be treated differently and they really don't think of themselves as [different] . . . to kind of have that [comfort] and look past one's disability but not . . . ignore it was something I learned.

This idea of learning about inclusive practices by working closely with people with disabilities appears in some of the early thinking of the organization. A former Senior Leader of the organization describes one of the early lessons he learned about inclusion as follows:

> One of the first things that we learned [in the 1980's] was, "You've got to bring in a person with a disability to train the staff." As much as my heart is in the right place and I've read books and I've studied things, I can't convince people that someone who is blind or has low vision can do science and explain science if they don't believe that. So we brought in people, both blind and hearing impaired, to do workshops. . . . We also had people who came and worked at the Museum for a period of a month or two, helping us with these projects and at the same time being a role model for the staff. We also began deliberately hiring staff with disabilities who could model explaining. We had one On-the-Floor Educator who had an unusual physical disability, he had no arms. It was a birth defect. So he had to operate things, pushing buttons, with his feet, and he was really good at it! . . . We discovered the kind of things you have to do. How do the doors work? Can you operate the doors with your feet or with your body if you don't have hands and arms? And he eventually became a very popular educator, and I think an entire generation of educators grew up understanding that a severe disability like this is not necessarily disabling for explaining science on the floor of a science center.

While staff members are quick to note the benefits of involving people with disabilities, they also freely discuss the challenges. Just like Abby and Patty, people with disabilities who are involved in the work experience some of the same challenges that

visitors face when it comes to fully accessing UCM. For example, a former On-the-Floor Educator who is a wheelchair user experienced difficulties getting to the Museum due to a lack of public transportation, which is a challenge visitors with disabilities report as well. Her former supervisor recounts the problems this caused not only for the Educator, but also for him:

> We had someone who came in who was wheelchair bound, and she really wanted to be an [On-the-Floor Educator], very bright. . . we understood what her needs were, that we couldn't necessarily make a set schedule for her. So whereas some other people could say, "I can be here from 1 to 6" or "I can be here 12 to 5,". . . [and] she tried her best to make sure she could fit a schedule, . . . the bus that would bring her here . . . just [wasn't] available to get here exactly at that time . . . so if her schedule was supposed to finish up at 5 . . . the [bus] could only come at 4:45 . . . a lot of times [the bus] would just go on by or . . . wouldn't show up and we'd have to call up. . . . There were days that we were here . . . an hour after she was supposed to leave, waiting for the [accessible bus], having to call in . . . I can't even count the number of times that the Museum would close at 6 and I'm here at 7, 7:15, 7:30, waiting for her bus to come in. I remember breaking a pair of shoes because I was running down the block because I saw the [accessible bus] going down the block. So that's something that's not in my job description to make sure that every

> [educator] goes home, but in this case, someone had to make sure that she got onto a bus safely.

Other challenges connect to the lack of certain support structures or detailed policies related to the employment of people with disabilities by the organization. For Abby and Patty, the lack of a clear policy around ASL interpretation for trainings is a barrier. For the former On-the-Floor Educator who uses a wheelchair, it was the lack of attention to the accessibility of staff areas that was a problem:

> For [an educator in a wheelchair], one of the demonstrations was down here on the lower level [and] . . . people couldn't see her in her wheelchair [behind the presenting table] because she's . . . very tiny . . . so . . . I went to the store and I bought four seat cushions so she'd be high enough. . . . Every time she would do a demo, we would lift . . . her up and put the seat cushions on her wheelchair so she could do the demo. She never complained . . . I'm grateful that she was comfortable with . . . whatever little adjustment we could make to make it work for her. (A Leader of the On-the-Floor Educators, UCM)

Given the challenges previously experienced, one of the Leaders of the On-the-Floor Educator program is also concerned about hiring future educators who have disabilities. She feels like the way she has been able to make the situation work, whether it is Patty, Abby, or any of the other educators with disabilities, is by personally sacrificing for these individuals or asking her staff members to do so. While the idea of hiring people with disabilities is something she values and feels is incredibly important

and is something that she feels the organization values, her perspective is that UCM does not provide the supports necessary for this effort to be successful. She feels that most of the burden of providing accommodations and a comfortable work environment falls on her:

> So I do feel like every time I come up with a cool idea, the idea gets supported, but it's like, "ok, but don't take too much time doing it and make it work." And so . . . I work . . . I don't know how many hours to make it work . . . And then I also feel like I put my team on the spot at times . . . so it's just a struggle that I have . . . my biggest concern is always that, if I leave this position or if the person in a wheelchair doesn't work on a day that I do, how are we going to make it work? How are we going to . . . get the buy-in from everybody else that this is important?

In the future, UCM may have more structures and policies in place that support the involvement of people in the work. A new Human Resources professional has recently been hired, which is viewed as "a critical step in being able to build a culture that is cognizant about issues that have to do with inclusion" (Senior Leader, UCM).

Abby's and Patty's story provides insight into how UCM involves people with disabilities in its work, providing a description of the experiences of individuals who have more intimate relationships with the organization than visitors such as Neil, Ben, Mark and Cindy who visit only a few times a year. Combined, these two lenses—that of staff members with disabilities and visitors with disabilities—provide an overall indication of the kinds of actions UCM takes and does not take to make the environment

more inclusive of people with disabilities. Given Abby's and Patty's inside status, their thoughts and reflections also yield some beginning insights on some of the processes and contexts that either impede or facilitate change at UCM. To dig deeper into understanding these processes and contexts, however, requires a closer look at the workings of the organization and its various departments and teams.

Viewing Inclusion through the Lens of the On-the-Floor Educator Program

As described above, the On-the-Floor Educator program is a significant way that people with disabilities become involved in the work of UCM. Although aspects of this program are already discussed above in the experiences of Abby and Patty, its work is discussed more broadly in this section given the critical role this program plays in the inclusion work of the organization as a whole.

Interviews with staff members reveal that UCM considers the On-the-Floor Educator program to be a key strategy for reaching and serving its diverse local community. The On-the-Floor Educators are high school and college-aged students from the local community who work part-time at the Museum and comprise close to a third of the organization's workforce. Collectively, they reflect the broad diversity (in terms of language, culture, and sometimes disability) that exists within the surrounding community. This program has been in existence for over 25 years. A former Senior Leader at UCM describes the genesis of this program as follows:

> The primary way that we [developed a diverse workforce], we did it through every level of the organization, . . . but also the On-the-Floor Educator program, deliberately hiring college students and then high

school students to be floor staff, part-time paid floor staff, . . . to try to bring them roughly in the same ratios as the proportions of various ethnic and language groups in the [surrounding community] . . . we had . . . at its peak . . . something like 200 part-time educators, all whom were paid. . . . They spoke 30 or 40 languages amongst them, but even more important than that they understood the needs of people who didn't speak English even if they didn't speak their language. They understood that some of them could be walking into a museum literally for the very first time in their lives and some of them wouldn't know what to do. Should these visitors just stand there until someone came up to them? Were they supposed to . . . go to the admissions desk? . . . What would happen there? And after they left the admissions desk, were they supposed to wait for a tour? They literally didn't know how to behave in the museum, what was expected of them or what could they expect of others. So the staff were trained from the moment they saw a visitor enter the door to begin to gauge what that visitor might need, how to make them welcome, how to make them friendly. That was achieved through the initial training of all staff, including back of the office staff but also through continuous training particularly for the floor staff. . . . The On-the-Floor Educator program, everyone knows about it, everyone knows that a large part of its purpose is to provide diversity of staff to induce a diversity of audience.

This practice of using the On-the-Floor Educators to provide supports and a comfortable environment for local community members is still evident in the thinking of the organization today:

> Because our On-the-Floor Explainers are the public face of the Museum, we seek to create opportunities for them that maximize their understanding for how to be broadly inclusive. I think, again, it's very much in the DNA of the [program]. Their training focuses on how to invite someone into a conversation about science that focuses on the person's interests and ideas. (Senior Leader, UCM)

Members of the On-the-Floor Educator program also see their role as one aimed at making a broad range of visitors feel welcome and included when they visit UCM. As one Supervisor of the program states,

> [For] everything that we do, we try and make sure it can be accessible to as many people as possible. We also try and know who our communities are so we can connect to them. We know we have a vision and we try and stick to our vision as much as possible, and we try and ignite a fire of science education in as many people as we possibly can.

The On-the-Floor Educators also articulate that they feel they play an important role in specifically making people with disabilities feel more comfortable at the Museum. As one Educator states,

> When there's someone [with a disability] that comes in . . . we don't judge them, we're always welcoming. We don't look at the disability that they

have. . . . We try our best to communicate with them and make sure that they're having a really good time here at the Museum.

Interviews with those who lead the On-the-Floor Educator program (Supervisors and other Leaders) reveal that they employ a number of strategies to ensure that the program is able to achieve this aim. These strategies include hiring people with disabilities (described above), providing formal professional development experiences for all educators, learning by trying things out, and partnering with external organizations.

Professional development and trainings are a key attribute of the On-the-Floor Educator program. According to one Senior Leader, "our educators get training once or twice a week. . . . We invest a lot of time and effort into training our educators." One Supervisor's job is even exclusively focused on On-the-Floor Educator trainings. Observations of On-the-Floor Educator trainings show a wide variety of topics being discussed, including visitor safety and the science content behind permanent and temporary exhibitions.

There have been multiple On-the-Floor Educator trainings that focused on people with disabilities. Many staff members throughout the organization recall past trainings Abby offered On-the-Floor Educators that focused on learning ASL. Current On-the-Floor Educators state that practices related to the inclusion of people with disabilities is something that is mentioned during "morning meetings." During a recent meeting, one On-the-Floor Educator remembers a discussion about demonstrations that make "loud noises" and how this should be mentioned to the audience "before we do that particular activity or demonstration." This same Educator states that weekly trainings also address

topics such as "how to best convey the message of the exhibit to the visitors and how to interact with all different types of visitors." Long-term members of the On-the-Floor Educator program, such as one of the current Supervisors, also recount numerous in-depth trainings that have been held over the years:

> We had a presenter come in . . . to . . . tell about how to work with visually impaired individuals . . . She did a very cute thing where she said that her hearing is perfectly fine . . . so there's no need for us to speak louder when we're speaking to her. . . . [She gave us] hints about . . . how to interact [with visitors who are blind/low vision] and being conscious of what the needs are. Then last year . . . we had an individual who studied autism and autistic children . . . come in and give a speech to the entire Museum. . . . Since a lot of our educators . . . weren't able to attend . . . we created a modified training that . . . fit into their normal training . . . to get them up-to-date on how to work with people with autism.

In addition to the formalized trainings, members of the On-the-Floor Educator program also report learning through their work experiences. One of the Leaders of the program describes how she learns about practices that are inclusive of people with disabilities by:

> Just doing it . . . finding an opportunity and just going for it and as an issue comes up, dealing with it, which, I don't mind doing. And I know my team doesn't mind doing, although later they would complain about it [laughs]. [They ask,] "Why can't we figure out these problems before we

start?" [And I say], "Because I don't know how to figure them out (in advance)!" [laughs]

Another strategy the On-the-Floor Educator program uses to further its work toward inclusion is to partner with external organizations. These external partners include schools and local community advocacy organizations. Currently, two new partnerships are being formed: one with a local high school for students with learning disabilities, and another with a local community organization that is establishing internships for students who are blind. According to one of the Leaders of the On-the-Floor Educator program, the external organizations initiated these partnerships. The partnership with the local community organization began with a grant proposal. The agreement to partner with the high school started with a conversation:

> We met last week with two people at . . . [a high school] for people with learning disabilities [that is] offering their students internships. . . . They take a group of students in chunks to different institutions . . . and they have somebody from the school there as support for the students. So we met with them to see whether or not this would be a good fit for them and we . . . all agreed that it would be great for them to start working with us. So in September they're gonna start the internship with us. They'll send three students, one or two days a week for a few hours, and they'll be . . . someone here with them. We told them that that person might not have anything to do because we train them and we prepare them for their roles, but just to have that backup person there would be great.

Interviews reveal that other organizations have also partnered with the On-the-Floor Educator program in the past. For example, the autism training cited above was led by a local community organization. One of the most extensive partnerships is one that previously existed between UCM and a local high school for the d/Deaf. Unlike the new partnerships that are forming, this one emerged over time and is unique in that the idea behind the partnership came from within the On-the-Floor Educator program:

> So years ago [My former supervisor and I] . . . were . . . interested in learning about sign language and . . . decided to connect with [local school for the d/Deaf]. . . . We found out that they had internship programs for their students. . . . We were taking classes [there] just to learn sign language for our own, but then we developed that relationship with the school. And then that year they . . . sent us two On-the-Floor Educators who were deaf . . . (A Leader of the On-the-Floor Educators, UCM)

Although it was the actions of On-the-Floor Educators that led to the partnership, the school for the d/Deaf eventually took an active role in the partnership and provided supports for the students during the early stages:

> One of the things I remember asking was . . . if they could have . . . interpreters here . . . they were at one point able to provide an interpreter for training so that was good, but that was just for a little bit and they couldn't provide it anymore. (A Leader of the On-the-Floor Educators, UCM)

Eventually, conditions changed at UCM and the responsibility for maintaining the partnership fell to one of the Leaders of the On-the-Floor Educator program. As this Leader says,

> The following year we did try it again . . . although that was the year that my supervisor had left, so I was the only one. So it was great the first year because I had someone that was working with me and could . . . sign as well, but the following year, and kind of since then, I've been the only one. So I . . . felt [the students during the second year] didn't get as great experience just because my . . . my role had changed, the amount of time that I could devote was less, and it was just me. So that made it difficult . . . I . . . felt like we couldn't offer the students the support that they needed to do the job here.

Perhaps due to the past difficulties of sustaining the partnership with the high school for the d/Deaf, members of the program's Leadership Team are somewhat pessimistic about the likelihood that their new partnerships will be sustained over time. One of the Leaders of the program describes her skepticism as follows:

> So this one organization contacted [another Leader of the On-the-Floor Educators] and said they would like to place interns in our preschool place who are blind and they will supply books and Braille that are appropriate . . . and they'll have the training and the staffing. . . . Now [it is] a year later when this is starting to come together, [and] there aren't any books and

there is not that much training . . . I'm thinking that probably this thing will work out in some fashion, but how sustainable it will be I don't know.

Despite this hesitation, the partnerships are moving forward.

Connections between inclusion in the On-the-Floor Educator program and other UCM areas. Although the On-the-Floor Educator program holds a unique position within UCM, serving as the focal point for efforts that welcome and include diverse audiences in the Museum, there are many connections that can be made between the work toward inclusion of people with disabilities undertaken by this program and that of other areas of the Museum. These connections include those that relate to the strategies the program employs to serve diverse audiences, the ways the program learns to be more inclusive, and the challenges the program faces in its efforts to better serve people with disabilities.

As the narrative above describes, one key strategy the On-the-Floor Educator program employs to welcome and include diverse audiences is to be present and available to assist visitors at the Museum. This idea—that the presence of helpful staff members can make people with disabilities feel more included—appears in discussions of the role of other front-line staff members as well. As one Visitor Services professional states, "As long as the staff is able to help [people with disabilities] and accommodate them . . . they can still appreciate [the Museum] and enjoy themselves." Another Senior Leader of the organization further states that a role of the Visitor Services department is to "[ensure] that [at] the very sort of grounded level we are accessible, accommodating, our staff is personable and engaging."

There is also evidence that front-line staff members, beyond those in the On-the-Floor Educator program, take substantial actions to make people with disabilities feel more comfortable at the Museum. One woman who works in Custodial Services describes an action she took to make an adult visitor with cognitive and physical disabilities feel more comfortable:

> One gentleman had an accident . . . we had to block completely the whole street level restroom and bring him some clothes. . . . We try to do everything just to help because we understand these people need attention, these people need help. If not us who work here, who else would help them?

Similar to the On-the-Floor Educator program, staff members from other areas of the Museum also see the inclusion of people with disabilities as part of the organization's overall focus on including a diverse range of audiences. As one Education professional (who is not a part of the On-the-Floor Educator program) states, "I . . . think you need to start with, 'How do I make sure that everyone feels welcome here?'" Another Education professional goes on to further declare,

> I think one of the things UCM does incredibly well is to really walk the walk when it comes to serving diverse audiences, and diverse meaning a very broad thing. . . . In a way it all comes back to comfort, whether it is a three-year-old or someone with a child with autism or a visitor who's not used to coming to a museum.

In addition to similarities between how the On-the-Floor Educators and other areas of the Museum think about practices related to inclusion, there are also overlaps in how this program and others learn to be more inclusive of people with disabilities. For example, other areas not only share an experience of learning by working with people with disabilities (as described above), they also similarly report that they learn through practice or "just doing it." According to a former Senior Leader, learning through experience and experimentation was a critical way that the staff members learned about inclusive practices right at the very beginning:

> We discovered [through implementation] that the technological solution [of an audio tour for the blind] was probably the easiest part; there were a lot of things that we hadn't realized when we were learning how to do that. Basically everything about operation of [UCM] had to change, the same as it was as it had been to become welcoming for the ethnic minorities: how did we advertise our program? How would low vision or blind people even hear about us? What would they feel like when they came into the building? What kind of materials did we have for them? Was our website . . . could they use it? And then the way the staff treated them turned out to be a huge issue . . .

In addition, other areas of the Museum also report working with external community organizations as a part of their inclusive practices work. For example, observations of a team meeting for a new exhibition where the content is related to people with disabilities reveals that this group is working extensively with numerous

disability-related community organizations and university research centers to create this exhibition. Previously, other groups worked with external organizations to create assistive technologies for visitors who are blind, which are no longer available at the Museum.

The volunteer program where teens with disabilities work to clean the Museum's cafeteria is also run by an outside community organization. Previously, there had also been an additional program that was run by another external community group. As one Visitor Services professional recalls, "We used to have another school who used to come early in the morning . . . and they . . . would wipe off the window sills and [clean] the cafeteria . . . tables . . . but unfortunately . . . the school never came back . . ." These last scenarios, of the volunteer program and the assistive technology for visitors who are blind, echo another theme that appears in the story of the On-the-Floor Educator program; external partnerships do not always lead to sustainable programs.

One aspect of how the On-the-Floor Educators learn about inclusive practices that is not as visible or prevalent in other areas of the Museum is the focus on trainings and professional development programs. Professional development trainings that focus on the inclusion of people with disabilities, however, have taken place previously in other areas outside of the On-the-Floor Educator program, although these trainings appear to have ceased over time:

> We used to do a [cross–department training] called visitor service training. . . . It was [about] working with visitors that . . . maybe had special needs or had special requests. . . . So it would be admissions staff and security

> staff and education staff and some of our leadership. . . . We . . . would have someone from the Museum lead it and you would learn . . . about how . . . you get from the lower level to the upper level if the elevators are broken, [or] what do you do if you have someone here that needs some type of audio equipment to communicate at the exhibits? . . . I got that training years and years ago, but it stopped because of budget cuts and people leaving and things like that. But I thought it was really useful because [it], in one respect put departments that maybe sometimes didn't communicate with each other in the same room and also gave everyone that same background information. So if a visitor came and needs a wheelchair, where would you get that from, which I don't think our staff knows today, but where could that be found? So it's a lot of logistical stuff, but information that I don't feel is conveyed right now. (Supervisor of On-the-Floor Educators, UCM)

The work of the On-the-Floor Educator program as described above provides a snapshot of what practices related to the inclusion of people with disabilities looks like for an area of the Museum where inclusion (broadly defined) is considered to be a major part of the program's efforts and purpose. The next lens provides a view of practices that are inclusive of people with disabilities from the perspective of an area of work in the organization where the goals and purpose are much more broadly defined—Exhibitions.

Viewing Inclusion through the Lens of Exhibition-Related Work

UCM is different from both LSM and OEM in that it does not have an official Exhibits department.[12] This lens, therefore, does not portray the story of the work toward the inclusion of people with disabilities within a particular department over time, but rather, tells of the history of a particular line of work and how practices within it changed over a number of years.

It was in the 1980's that many long-term (current and former) staff members recall making "the first real major effort to look for what kind of accommodation we'd need so that low vision and blind visitors would feel welcome and would use the place" (former Senior Leader, UCM). This effort consisted of "audio tours for the Museum that ultimately morphed into audio tours for visually disabled visitors" (Exhibits professional, UCM). This project was funded through multiple federal agency grants, which were pursued by the person who was serving as the Museum's CEO at the time. Staff members who worked at the Museum in the 1980's have a sense that it was this CEO who "pushed" for the tours to be developed.

Although the idea behind the tour came from within the Museum, much of the work was conducted by an organization outside the Museum. This organization donated the audio tour "instruments" and a person from that organization was hired "to do the scripts for us" (Exhibits professional, UCM). In addition, multiple individuals who are blind or have low vision were also involved in this project as consultants or expert

[12] Although there is no official Exhibits department, there are a number of individuals whose work focuses almost exclusively on the development of new exhibitions. These individuals are referred to in this narrative as "Exhibits professionals" as this is how they would be identified by professionals from other museums.

visitors. Their involvement had a profound impact on some of the staff members, which the following comment from a long-term Exhibit professional exemplifies:

> And I was astounded that the impaired visual expert consultant who herself was visual impaired insisted on [focusing on the microbiology exhibit] . . . I said, "There are microscopes—what do we do?" . . . and she said "well there is a range . . . of visual impairments" . . . and it is exciting stuff! . . . We wrote in effect to describe what they were seeing, and it was really extraordinarily eye opening for me. . . . The evaluations we got were very good and people expressed gratitude and enthusiasm, "I wish that other places would do things like this." But we were bringing those people in especially . . . to see . . . how the audio tour functions here in our environment with the exhibition, but not to necessarily to assess how useful it was for them in their lives or how much they would be able . . . to use it.

Sustaining the audio tours proved challenging and "over the years, the program languished" (Exhibits professional, UCM). One Exhibits professional attributes the lack of sustainability to the fact that "there was never really any push to offer this to visitors to ensure that people got it." This professional also feels that "when [the former CEO] left there was just not much interest in it." Others state that the lack of sustainment is tied more to lack of use and audience demand. For example, a current Senior Leader of the organization makes the case that "when we offered the audio tours for free, literally nobody took them." Sustaining the audio tour, however, has always been a problem, even

during the height of its implementation. Even the former CEO recalls a time when sustaining the operation of the audio tour was difficult when he was at the Museum:

> We had these Universal audio tours, but the front desk staff didn't know to offer them. They're free for visually low vision or blind visitors, and the new staff didn't know that. Somehow the page in the operations manual had . . . fallen into disuse so that new admissions desk staff didn't know to offer those, which they're supposed to do. I think it's something that requires constant maintenance . . . I do remember at one point coming down [and seeing] that the audio tour rack for the audio tour units, someone had unplugged it! So none of the units were charged up, they couldn't be used and no one seemed to feel any sense of obligation for plugging it back in. I remember worrying around and complaining about this and "Who's in charge?" and "Where's your instructions sheet on how to start this thing at the beginning of every day and make sure the units are working and maintain them?" And no one could find it, so . . . I got on my usual director's high horse, "This is critical, I want this done every day. You prepare a new checklist, you make sure it's checked every week. I want a report every month on how many times we miss this sort of thing." So the fact that it wasn't something that you could put in place and then "relax, it would work," that was a surprise and a disappointment.

Eventually, the audio tour was dismantled. Even though the tour is no longer offered, some staff members in the organization (including front-line staff members who

are responsible for communicating with visitors) discuss the tours as if they are still being offered to visitors who are blind or have low vision. For example, one On-the-Floor Educator says, "At the front you can get [an] audio recording that you walk through the exhibit, you press a number and it describes the exhibit." Why this confusion may exist is unclear.

After the audio tour was installed, the next major exhibition project focused on creating a wayfinding system for visitors who are blind. This tour combined cellphone and audio beacon technology so that "basically everyone had their own personal noise to help guide [them] around the Museum based on a specific tone" (Senior Leader, UCM). In addition, as part of this effort, the Museum installed a key experience for visitors who are blind, which the wayfinding system would lead them to. This experience featured "a touch model of [UCM objects] where visually impaired visitors could feel the [object], touch it and as they moved up and down the [object], they would get audio describing [it]." This experience was also considered to be "a mixed exhibit because it was a monitor which gave information to non-visually impaired visitors . . . so it really was designed as an exhibit that can be used successfully by both visually impaired and non-visually impaired folks." (Exhibits professional, UCM)

Similar to the audio tour, the creation of this wayfinding system was led by an external organization. The need for this system, however, stemmed directly from lessons learned when the initial UCM audio tour was tested with visitors who are blind or have low vision:

We invited [people who are blind from a local community organization] to come and try out our audio tour system and just give us any feedback. . . . Here's the interesting thing that happened—they all came with someone else to get them [to the Museum]. Often it was someone else with low vision but not with as little vision as they had . . . they said, "You know, the tour really seemed great. I started using it and it was wonderful, but I couldn't keep up the pace with my friend. I was afraid my friend was getting impatient, so I would not be able to listen to all of the audio tour because when they were ready to move on, I had to move on too. The audio was telling me how to manipulate things and it was working great, but it took longer for me to do it than it took them. So it really wasn't working and I wasn't going to keep using it and I probably wouldn't come back because I'd feel ill at ease as if I were holding back the person who brought me there." So then we realized that the problem was for some visitors, for blind visitors in particular, if they couldn't really move around the Museum entirely on their own autonomously, then they were going to feel they were holding back someone even partially sighted and the solution to that was a navigation system so that visually impaired visitors could move around the Museum at their own pace. . . . So we wound up working with a small company that had developed an audio beacon system and we worked with them, we helped them get [a federal agency] grant

and they actually created a working audio beacon system. (former Senior Leader, UCM)

Similar to the original audio tour, the wayfinding system was also viewed favorably by visitors who are blind or had low vision who had an opportunity to use it. One current Senior Leader remarks that a frequent UCM consultant who is blind "loved it—she still talks about it." The system was only designed to be a prototype, however, and as "it was never meant really to be installed," eventually "it just went away" (Exhibits professional, UCM).

Although the wayfinding system was designed to be only a temporary installation, the accompanying tactile model-based interactive is still supposed to be available for visitors to use. While it is still installed, it is not functioning properly. When a frequent UCM consultant who is blind and was involved in this project is observed using the interactive, she finds that the audio is not activating properly, the volume is too low when the audio does activate, the stool for using the exhibit component is missing, and part of the tactile model has broken off and been removed.

Following the work with the audio tour and the wayfinding system, the Museum began working on a new wing. Most of the exhibitions in this area were developed by an external consulting group that specializes in developing exhibitions and is known for its accessible designs. At least one exhibit component in this wing addresses content related to people with disabilities. This exhibit, a "wheelchair race game," shows "two different types of wheelchairs," including "a regular wheelchair that can be used for everyday activities and . . . a racing wheelchair" (On-the-Floor Educator, UCM). Otherwise, staff

members do not frequently mention the exhibitions that are part of this new wing as being connected to their efforts to include people with disabilities.

One Exhibits professional, however, feels the Museum has always been mindful of designing for people with disabilities, especially wheelchair users, when creating new exhibitions, which presumably includes efforts related to the new wing:

> Every time the exhibit process goes through, it's always wheelchair access – can they get around the exhibit? . . . We're very mindful of that . . . for the most part like I'd say, 95% are accessible, but there are some things we can't make them accessible . . . but basically, the general rule since I've been here has been, we've done as much as we could possibly do to make it as accessible as possible. . . . It's mostly the ability for the heights and the ability for getting the wheelchair up to the exhibit and . . . whatever manipulatives that are there, for someone to be able to reach it. . . . There are a couple exhibits that just couldn't allow a wheelchair to go straight under, but they can get at it from the side and they can still manipulate what has to be manipulated.

The biggest recent project related to the inclusion of people with disabilities is a traveling exhibition, currently under development, that connects to the topic of disability. While UCM is leading this project, they are again working in collaboration with other organizations, including university researchers who are studying technologies for people with disabilities, local organizations for teens and young adults with disabilities, and another science museum that frequently creates exhibitions for others. Staff members

working on the exhibition see this collaborative aspect of the project as one of its strengths, especially the involvement of people with disabilities:

> I think because we have people on the team who have experience with universal design, and have people on the team who have worked at occupational therapy, [and] we have advisors who have been willing to push us towards things that we are not comfortable doing, I think that is all going to work out for the better. . . . It is a positive program . . . because we are including people in the development process that actually have the disability. . . . It's the whole idea of . . . user-centered design and our users are people with disabilities. And it's kind of fun. (Exhibits professional, UCM)

Professionals who are working on this exhibition report learning about disability culture and narrative through this "user-centered design" process:

> One of our participants is an engineer . . . she is 22, she uses a wheelchair to get around both standard and . . . electrical, but she is extremely voiceful about what she doesn't want [others] to think about her; she called it . . . the hero complex. She doesn't want people to come up to her and be like "oh my gosh, you are so brave, I can't believe that you can live with these disabilities" . . . I think that she really helped us to understand . . . what some people with disabilities don't want to hear how they don't want to be placed on certain pedestal. . . . And so through [this project] we learned a whole lot about that, at least I did. (Exhibits professional, UCM)

Team members also state that they are learning about exhibition practices that are inclusive of people with disabilities through this project, although this learning appears to come mostly by examining the practices of other museums.

> We were looking at [a particular aquarium's] exhibition and hearing about all the various super accessible technologies, the 3D models, the . . . technological sensors, all the . . . audio labels and everything and . . . just a zillion of different kinds of accessibility features . . . one of the things that [a Senior Leader] said was . . . what he wants this project to figure out how to do is to add to the world of accessible exhibit design, give . . . something new or useful to the world of accessible exhibit design but not that we can necessarily adopt *every* single best practice that's ever been invented, that we have to have a balanced approach. (Exhibits professional, UCM)

This new project appears to have the attention of multiple people across the organization beyond those who are working on the exhibition team. One Education professional reports, "I know that there's an exhibit being developed by [Senior Leader] . . . that is focused on disabilities, although my understanding is that it's supposed to be focused on ableness . . . and I've heard people give talks about that different orientation." Another Visitor Services professional goes on to further state that she became peripherally involved in the project during one particular advisory committee meeting:

> I know . . . [the exhibition team was] having a meeting [that] included about 20 people that we would normally try to do in a classroom . . . , but

> of the 24 participants, 20 of them were motorized wheelchairs which require obviously a much larger space than a simple classroom because . . . that many motorized wheelchairs would take up a considerable amount of space . . . so we actually did it in our [temporary exhibition] gallery . . . and we rented tables and chairs and we produced the meeting in there instead . . . and that's an example of getting out of the mind frame of "oh well, it's just not gonna work, they won't fit." It's like, "No we have to make this work, how can we do it?"

This project is viewed by staff members as being championed by a current Senior Leader in the organization who has a close relative with a disability:

> I really feel like it was an emotion and personal experience driven grant . . . I think the idea of it came from someone's very personal experience . . . someone who lives with a person with disabilities. But I think that's extremely positive because it allows people who are working on the project to also have that personal connection and really be focused on making this exhibit one in which people with disabilities can be involved in an extremely engaging and fun way and not just sit on the side and let someone else experience it. (Exhibits professional, UCM)

This Senior Leader, however, does not necessarily see himself as a champion. He sees the effort to develop this exhibition as being one that is led by a group, and he feels uncertain about his own role in advocating for the inclusion of people with disabilities in the Museum:

> And I would have to say that [name of exhibition] is departmental, a small group of us . . . I don't think I have been such a good advocate. Being a [relative of a person with a disability] is a double edge sword from that point of view because you have so much of the experience that you realize—that no place, when you have a hard time with mobility, no place in the world is going to flatten itself. I sort of have this maybe over compensation, I think there's too much into it to sort of say . . . "people have to find their way around places the way the world it is." So I haven't been a great advocate or hero I would say. I think [this exhibition] is a little bit of an outlier in my experience in terms of what I have done here.

Similar to the wayfinding system, this new exhibition is scheduled to be a temporary installation at UCM. Whether or not any of the practices or ideas generated through its development will have a lasting impact on the organization is still undetermined.

Connections between the work to create exhibitions that are inclusive of people with disabilities and other UCM areas. Some commonalities can be found across the narrative descriptions of each of the major exhibition-related initiatives described above: each was championed by a Senior Leader within the organization, involved people with disabilities in the design and development, included partnerships with external organizations, built upon prior work (whether that work was internal or took place at other museums), and was funded through specialized grants. These themes are not just connected to the work related to developing exhibitions that are inclusive of people with disabilities, but to the work of inclusive practices in other areas of the

Museum as well. Some of these themes have already been mentioned above, while others are being introduced for the first time in this description.

As is true of the work of the On-the-Floor Educators, the work of Exhibits also extensively involves external partner organizations. While the On-the-Floor Educators have largely collaborated with disability-related organizations, partners for exhibition work related to inclusion represent a broad range of institution types, including universities, other museums, consulting firms, and small businesses that cater to museum clients. Similar to the On-the-Floor Educators, in some cases the partners initiated the work with Exhibits, while in other cases it was individuals inside UCM who initiated the work with these external partners.

As a part of the work of developing exhibitions that are inclusive of people with disabilities, staff members not only partner with other museums, they also look to the work of other museums as exemplars to be followed and built upon. Other areas of the Museum also employ a similar practice. One Education professional states that "over the past two years . . . we've been . . . doing research into what other institutions do to serve families with kids on the spectrum." A former Senior Leader recalls that "when we were developing our first [professional development trainings around people with disabilities] we . . . brought in people from other museums to tell us how they did it."

The idea of building upon prior work that took place internally as well as externally appears in the description of the work of inclusive practices for UCM exhibitions as well. This again connects to a theme from the description of the work of the On-the-Floor Educators, where these educators report learning through their practice

over time. What is different between the two areas of work, however, is that evaluation studies involving people with disabilities is a part of the way professionals learn about exhibition practices that are inclusive of people with disabilities, which is not necessarily the case for the On-the-Floor Educators.

Another emerging theme where there is a connection between the work of Exhibits and the work of the On-the-Floor Educators is the fact that the inclusion work appears to take place in stages, with different audiences or approaches being a focus at different points in time. For the On-the-Floor Educators, the stages seem to correspond with partnerships that focus on specific disability audiences (first a focus on individuals who are d/Deaf, then autism, and then blind/low vision and learning disabilities). For Exhibits, there appears to be two stages of work: one focused on auditory assistive devices for visitors who are blind or have low vision, and another focused on and exhibition where the inclusion of people with disabilities is both the content and the educational practices. Staff members remark that the work toward the inclusion of people with disabilities overall in the organization has moved forward in different stages:

> It's gone in stages . . . thinking back there was a really large push to really make us more accessible to people who were visually impaired. That, I believe was sometime in the '90s, so that was a huge push. And then in the early-mid 2000s is when we started working with [school for the d/Deaf]. So that was more of an On-the-Floor Educator push . . . and then the autism was something that was a really big push last year, so I don't think anything has happened like every, like one versus the other, but as the

> time has gone on and we've interacted with people with different needs and things were brought to our attention, we've definitely taken action toward them. (Supervisor of On-the-Floor Educators, UCM)

For the work of exhibitions, each new stage corresponds with grant funding, which is also true of some phases of work for the On-the-Floor Educators as well. This may explain in some ways the feeling expressed by staff members that work toward the inclusion of people with disabilities cannot take place at the organization without specially-designated or extra funding. As one of the Leaders of On-the-Floor Educator program remarks, "if you can get a grant . . . then obviously you're gonna get a lot of buy-in for it, but if your idea's going to cost money. . . ," then it is more difficult. Another Education professional echoes this sentiment saying, "When it comes to special needs or inclusion things . . . you *have* to have some money behind it to make it happen." An Exhibits professional further affirms "we can't specialize things without specialized funding."

As discussed above, internal champions play a critical role in advancing exhibition practices that are inclusive of people with disabilities, and here again, is another common theme seen in other areas of the Museum. For work related to exhibitions, these champions tend to be Senior Leaders. In the On-the-Floor Educator program, it is similarly one of the Leaders of the program who is frequently cited as the champion. With regards to the work the Museum is taking on to include children with autism, however, it is not a leader of any particular area that is advancing the work, but rather an individual who has a personal investment in this topic:

> We recently . . . have done some staff training on working with people with autism. . . . Then recently . . . we held a[n] . . . autism panel . . . for . . . parents of children with autism. . . . It was . . . a panel discussion with three or four people thinking about science and education for students with autism, and this was all kind of triggered because one of our development folks . . . has a child with autism . . . so she's very passionate. (Education professional, UCM)

Staff members concur that individual champions play a critical role in advancing practices that are inclusive of people with disabilities within the organization. As one Exhibits professional states, "You need somebody with a passion to push these things. If you don't have that, it is just not going to happen." Another Senior Leader in the organization goes on to further explicate this connection between action and champions at UCM:

> I think this whole issue of having an advocate and someone who is really committed to it who is empowered at some level to move the idea forward, seems to me how things around here happen. So [the former CEO] was really interested in this idea about audio tours and audio tours for people who were blind, [an Exhibits Professional] was really interested in [the audio beacons], the On-the-Floor Educator team was interested in ASL and deaf people and other people with disabilities, as the family programs we going interested in working with kids with autism, so there are all these individuals who just kind of rise up and say "well this is something I think

> is important for us to explore" so that is great and I say the downside is that it doesn't become a sustainable . . . initiative.

As this last quote alludes, the focus on internal champions may have its limitations. As the above description of exhibition work details, and also as the work of the On-the-Floor Educator program suggests, many of the efforts the Museum has taken over time to make the environment more inclusive of people with disabilities have not been sustained. Some staff members connect together the reliance on individual champions and specialized funding to this lack of sustainability:

> With each of our programs there isn't much of a sustainability factor in any of these things, because it is very driven by the passion of a person, a staff member, or it is very driven by grant money like when funding goes away, and then when situations get tough, there are remnants of, like, the program that are in place that are a good thing but not in a very sustainable way. (Senior Leader, UCM)

One potential contributing factor to the lack of sustainability of inclusive practices that is not mentioned by staff members is the reliance on external partners to do the work. If a program or exhibition relies on an external partner, and the partner withdraws, this also seems to correspond to a lack of sustainment of that activity at UCM. The audio beacon system (including the tactile model interactive) was developed by an external group, and this was not sustained. Similarly, as described above when talking about the involvement of volunteers with disabilities at UCM, one volunteer program was not sustained because the partner decided to terminate the relationship.

There is one further theme that is present in the work related to Exhibits that is not prevalent in other areas of the Museum, but is consistent with a theme that emerges in the two other cases: the role big projects play in advancing the work of inclusion. As the above description illustrates, the new exhibition that is being developed is receiving much attention throughout the organization and is involving multiple departments in the effort, even if somewhat peripherally. This project in particular is raising awareness for inclusive practices across the organization.

In summary, efforts toward the inclusion of people with disabilities through the redesign of exhibition elements began over 20 years ago. This work was initiated by the person who was the CEO of the Museum at that time, yet, efforts to make exhibitions more inclusive still exist at UCM today, long after he left the organization. While efforts are still being made to make exhibitions more inclusive of people with disabilities, some of the individual practices that were previously employed have not been sustained over time.

A number of factors correspond to changes in practices that make the exhibitions more inclusive of people with disabilities. These include "specialized funding," internal champions who push the work forward, intentional experimentation, partnering with and learning from other organizations, and involving people with disabilities in the work. What the above description illustrates, however, is that some of the processes that staff members associate with advances related to the inclusion of people with disabilities at the organization (such as internal champions and specialized funding) are also associated with the lack of sustainability of those practices.

Viewing Inclusion of People with Disabilities across the Lenses at UCM

Viewing practices related to the inclusion of people with disabilities at UCM across the four lenses provides a holistic view of what the change toward inclusion looks like at this urban and community-focused science museum. These lenses afford the ability to identify areas where changes have and have not taken place related to the inclusion of people with disabilities within the organization, which in turn helps to identify the kinds of processes and contexts that facilitate, detract, or impede changes from taking place that make the Museum more inclusive of people with disabilities.

Similar to the other two cases (the Large Science Museum and the Outdoor and Explore Museum), looking across the four lenses reveals that change has occurred and is occurring related to the inclusion of visitors with disabilities as the organization learns and adopts new practices over time. Such practices include attention to the needs of visitors who are wheelchair users in the building's physical design (level pathways/ramps and elevators); involving people with disabilities as On-the-Floor Educators; providing professional development for staff members that connect to issues of inclusion; attending to accessibility concerns in exhibitions (especially providing ample seating and captioning); discussing disability-related content in exhibitions and programs; addressing the inclusion within special programs (including providing accommodations for parents who ask for them through sign-up programs and offering virtual visits to homebound children); and having visitor services and policies in place to make the Museum more inclusive of people with disabilities (including an emphasis on safety, the availability of wheelchairs and strollers, and a policy for service animals).

The lenses of the On-the-Floor Educator program as well as exhibition-related work yield insights on the process of change that lead to the implementation of inclusive practices, such as those cited above. Across both of these lenses, staff members report that they see the change toward the inclusion of people with disabilities as being an on-going process that happens in stages, with different stages focusing on different areas of inclusion. These stages are often initiated when the organization acquires specific funds to focus on a specialized practice, when the organization is contacted by an external organization that is interested in this practice, or when an internal staff member decides to champion and push forward that practice. When such a practice is being implemented, it changes and morphs as staff members seek out information about the practices of other organizations, learn by working with people with disabilities, experiment and test new approaches, and participate in professional development trainings.

Two of the processes that facilitate change (involving people with disabilities in the work and professional development) are also cited as practices intentionally taken to make the Museum more inclusive of people with disabilities. In this way, these practices are both actions taken by the organization to be more inclusive, and the way that the organization learns to be more inclusive.

While substantial changes have taken place and continue to take place over time at UCM, one of the on-going challenges this organization faces is sustaining inclusive practices. The description of the work related to inclusive exhibitions shows that this effort has not yet had a lasting impact on the exhibition experiences of people with disabilities, with none of the new practices being effectively sustained over time,

including the provision of accessible technologies such as audio interpretation and a wayfinding system for visitors who are blind. Similarly, the On-the-Floor Educator program has experienced difficulty maintaining the involvement of people with disabilities as educators.

Despite the difficulty sustaining specific practices over time, UCM staff members continue to take actions to make the Museum more inclusive. Inclusion is still a stated value at all levels and in multiple areas of the organization. Staff members continue to develop and employ new practices with the aim of making the Museum more inclusive, and have also sustained their knowledge base of what is needed to make the Museum more inclusive of people with disabilities (for example, they know that individuals who are blind need a better wayfinding system in order to navigate independently in the Museum, even if they no longer have such a system available). This suggests that sustaining inclusive practices takes more than knowledge of the need for those practices and a valuing of inclusion.

Looking across the lenses of the On-the-Floor Educator program, the exhibitions-related work, and the experiences of Abby and Patty again reveals some indications for why certain practices are difficult to sustain. Across these lenses, there is evidence that when the impetus for initiating the work goes away (such as the specialized funding, the individual who championed it, or the external partner), so does the work. It may be that UCM's over-reliance on these elements for initiating change is the very reason why the work is not sustained.

In addition to those practices that the organization has struggled to sustain, there are also those practices that the organization does not consistently apply. One inconsistent practice, the presence of multisensory interactives, staff members identify as being an area where greater work is needed. The inconsistency of this practice, combined with the lack of action related to other practices that staff members identify as being needed (including better access to the Museum via public transportation, improved communication with people with disabilities, providing special events for people with disabilities, and creating environments that are more accessible for people with intellectual or cognitive disabilities), provides further support for the idea mentioned above—sustaining inclusive practices involves more than simply knowing about the need for such a practice.

Other inconsistent practices (such as the provision of ASL interpretation, attention to wheelchair access in exhibitions, and staff members who are available to help) are those where there are differences in perceptions between staff and visitors, with staff feeling more positively about these practices than the participating visitors. Other inconsistent practices, including the presence of wayfinding aids and use of interpretive images, are those that visitors with disabilities mention, but not staff members. This suggests that one of the barriers to change is that UCM is not necessarily learning all it could about how people with disabilities experience the Museum. This is further confirmed by the fact that visitors identify the need for a number of other practices that staff members do not mention in their interviews, including creating labels with large,

high contrast and easy to read fonts, maintaining accessible technologies and other exhibit elements, and making food and drink available in the exhibit halls.

Beyond the processes and practices that impede or facilitate sustained change, there are elements of the context of UCM that appears to influence actions taken by staff members to make the Museum more inclusive of people with disabilities. As stated above, "inclusion is in the DNA" of UCM. Due in large part to the location of the Museum and the diversity of the surrounding community, reaching and serving all audiences is a high priority. Staff members link their efforts to include people with disabilities to this larger diversity initiative. Therefore, the influence of the context of UCM (a community focused organization located in an urban and diverse community) cannot be ignored as this context may positively influence the staff's willingness to reach out and serve people with disabilities.

Another contextual factor that appears to support inclusion at UCM is the presence of local community organizations that serve or are comprised of people with disabilities who are interested in partnering with UCM. While it is difficult to determine whether it is UCM's prior efforts that attract these partners to the Museum, or the presence of these partners that prompts UCM's efforts, what is important is that there is a relationship between the two. UCM relies on the presence of local partners to achieve some of its work related to the inclusion of people with disabilities. The same is true for the partnerships UCM forms with other museums.

There are other contextual factors, however, that impede UCM's ability to be more inclusive of people with disabilities. One significant factor is the lack of adequate

public transportation to and from the Museum. This hinders not only access to the Museum by potential visitors with disabilities, but also the involvement of people with disabilities in the work of the organization. It is this latter issue that may negatively affect the sustainment of and change toward inclusive practices as it is the involvement of people with disabilities in the work of the organization that appears to be a significant supporter of inclusive practices.

There is one final element of inclusive practices at UCM that is worth noting as it is something that sets it apart from that of the other two museums. It is not a practice or process or context that exists at the Museum, but rather a mindset that is NOT present within the organization. While the theme of "better for everyone" appears in the remarks of staff members at OEM and LSM, it is largely absent in how staff members at UCM talk about practices that are inclusive of people with disabilities. Although staff members at UCM do see the inclusion of people with disabilities as being part of their larger effort to be more inclusive of a broad range of audiences, most do not overtly state that the practices they employ to make their environment inclusive of people with disabilities will improve the experiences for other audiences.

This case description provides a window into understanding how one museum operating in a particular context, the Urban Community Museum, has taken actions to be more inclusive of people with disabilities. As described above, there are some shared actions, practices, and ideas that extend across the museum when it comes to the inclusion of people with disabilities. There are also areas where further actions could be taken to make the museum more inclusive of people with disabilities, and in some cases,

staff members recognize the need for those actions. The greatest challenge facing UCM, however, is learning how to sustain the changes it does enact.

This organization is in many ways unique. It is located in a large metropolitan, yet it is not a particularly large museum. It has a national reputation, yet it also is very focused on meeting the needs of its immediate community. Due in part to its location in a highly diverse community, this organization is committed to reaching out and serving a broad range of audiences. Like the other two museums, however, UCM is highly collaborative when it comes to working with external partners. Similar to LSM, UCM is also going through an extensive organizational change that involves restructuring of the various divisions and departments.

The three museums operate in contexts that vary from one another, yet there are some overlaps. These museums are located in very different communities and have varying cultures, yet they are all part of the same field and have a history of collaborating with external organizations. Looking across these museums, what similarities and differences are seen with regards to the inclusive practices that are employed? How about in the processes, contexts, and practices that support, facilitate, or impede change? The next chapter addresses these questions.

Chapter 7: Understanding the Quintain

While the previous three chapters describe the change toward the inclusion of people with disabilities at individual science museums, this chapter provides both a description and an interpretation of the change toward inclusion across all three case sites, otherwise known as the "quintain" (Stake, 2006, p. 4)Through the exploration of the similarities and differences across the three sites, a picture emerges of what the change toward practices that are inclusive of people with disabilities may look like in other science museums, both now and in the future.

The three cases that comprise the quintain have many similarities. As a reminder, these cases are included in this study because they: (a) have a previously identified history of sustained efforts related to the inclusion of people with disabilities; (b) are located in the United States; and (c) belong to the same field of science museums. Given these selection criteria, it is perhaps not surprising that the sites operate within similar external contexts; they each belong to the same professional organization, receive funding from the same federal grant agencies, are visited by the same kinds of audiences (a mixture of family groups, school groups, and to a lesser degree adult-only groups), and need to adhere to the same federal laws (such as the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act). These commonalities would presumably apply to many other science museums in the United States as well.

The sites also seem to have similar internal contexts, common to most science museums in the United States currently, including shared educational philosophies (featuring hands-on, interactive learning experiences) and organizational cultures

(focused on visitors). These organizations also have overlapping contexts as they each have at least one partnership with the other two organizations. It is the commonalities that exist between these museums that enable connections to be made between the change at these three sites and that of a broad range of other science museums.

There are also variations between the sites. These sites are located in different geographic areas (Northeastern, Southern, and Midwestern United States, as well as urban and suburban neighborhoods) and different sized cities (Urban Community Museum (UCM) is in one of the largest US cities, while the Outdoor and Explore Museum (OEM) and Large Science Museum (LSM) are in mid-sized cities); have divergent kinds of educational offerings beyond hands-on activities (LSM has an object-based collection, OEM has live animals and other nature facilities, and UCM has outdoor play spaces); vary in terms of size of the campus, budget, and audience (OEM and UCM are considered mid-sized science museums, while LSM is considered a large science museum); and differ in terms of reach (LSM is international in its reach, while OEM and UCM focus more on the local audiences that visit their sites). Two of the three sites are also undergoing substantial changes to their organizational structures, which includes layoffs and other disruptions. These variations provide a way to see how particular changes may be tied to particular aspects of the sites that connect to some other science museums, but not all. Combined, it is the similarities and differences of the cases that strengthen the usefulness of the quintain.

The previous three chapters describe the change toward inclusion in each case through four separate lenses: the lens of a person(s) with disabilities who visits a science

museum, the lens of a person(s) with disabilities who is involved in the work of a science museum, the lens of a program known internally as an exemplar of inclusive practices, and the lens of the exhibition work and change over time. This chapter revisits these lenses, looking through each lens to examine all three cases simultaneously.

Viewing Inclusion through the Lens of Visitors with Disabilities

The people with disabilities discussed in the three case descriptions visit three different science museums, yet their experiences are similar in many ways. For the most part, the experiences of these visitors could largely be described as inclusive. Blamires (1999) sets forth that there are three different aspects of inclusion when thinking about students with disabilities in classroom environments and that each are important: physical inclusion, cognitive inclusion, and social inclusion. Applying this framework to science museums and other informal science learning venues, inclusion is defined as follows:

> Learners must be able to physically navigate through and perceive the space so that they are aware of the available learning opportunities from which they can choose . . . learners [must] be able to cognitively engage with the learning materials and . . . the context framing these learning materials [must] reflect a variety of lived experiences . . . [and] . . . learning . . . requires social interactions among a group of learners. (Reich et al., 2010)

There is evidence that the experiences of people with disabilities at these museums meet all three aspects of inclusion. Fred and Holly find LSM to be easy to navigate in their wheelchairs (open pathways and easy to reach exhibitions), are excited

by and personally connect to the content in the gallery about the local river, and report positive social interactions when they visit the Museum with their children and grandchildren. When visiting UCM, Ramona reacts positively to the physical design of the early education area, socially engages in parallel play with her younger brother in the pretend grocery story, and cognitively attends to the science content in one of the Museum's computer kiosks. Similarly, Rich at OEM expresses that the Museum's layout and accommodations, such as the location of the parking, the wide pathways, the consistent use of automatic doors, all work to create a welcoming physical environment for him. Socially, the Museum is a place where he frequently spends the day with his grandson, and cognitively, at the end of his visit for this study, he reports to his wife that he "learned a lot."

Most of the participating visitors with disabilities associate the three case museums with positive experiences. Similar to Rich, other OEM visitors with disabilities use terms such as "love" and "great" when describing how they feel about this Museum. At LSM, one father-daughter pair (both have disabilities) reports that this Museum is the source of "some of the better memories for our family." Even at UCM, where Ramona's experience at UCM is not always positive, another family with multiple children on the autism spectrum reports that they enjoy the Museum so much that their aim is to visit the Museum every other week.

At each of the three museums, however, there are also areas of inaccessibility that make these same visitors feel uncomfortable or unwelcome. For example, although Fred and Holly enjoy their overall experience at LSM, they are frustrated by the parking for

wheelchair users and by how they are treated by other visitors at the Museum. Similarly, the same visitors who express that they "love" OEM also report that they find it difficult to navigate the Museum's large and hilly campus. At UCM, the mother who frequently brings her children on the autism spectrum to the Museum also expresses that it is very difficult for her children to navigate and move around the building. Although some of these areas may be similarly difficult for visitors without disabilities as well (for example, wayfinding is often problematic for many museum visitors), the participating visitors with disabilities make connections between these challenges and their personal disabilities.

Commonalities between the inclusive practices across the three museums. Looking at the experiences of all the participating visitors with disabilities, commonalities can be identified in the practices that are consistently, inconsistently, or not at all employed across the three museums (see Table 10)[13]. Closer examination of these commonalities provides insights on the conditions and processes that facilitate or impede change toward inclusion in these museums.

Common practices employed across all three museums. Why are some practices, but not others, consistently (or nearly consistently) employed across all three sites? While it is hard to answer this question definitively within the context of this particular study, there are some common elements between these practices that provide indications of the kinds of inclusive practices that are likely to be adopted and sustained by science

[13] Practices were identified as being consistently/nearly consistently applied if they were identified as actions taken across all three museums, or as actions taken at two museums and as inconsistent actions at another. Practices were identified as inconsistent or not at all applied if they were identified as such across two or more museums.

museums. One common thread is that some practices are clearly identified as being necessary accommodations within the ADA. These include: a service animal policy, captioning, elevators, pathways that are navigable by wheelchairs, and attention to the physical dimensions of exhibitions. The connection to ADA, however, can only partially explain the consistency of implementation as there are other ADA requirements (such as the need to provide interpretations in a format that is accessible to people who are blind) that are not consistently employed.

Another connection between these elements is revealed through the way staff members describe these accommodations. In almost all cases, when staff members discuss these practices, they describe how they benefit people with disabilities as well as individuals without disabilities. For example, staff at all three museums frequently describe some of the practices that make the environment more accessible for wheelchair users (such as the elevators, navigable pathways, and attention to the physical dimensions of exhibitions) as also being beneficial for a variety of other visitors, including moms with strollers, older adults, and young children:

> All the doors are . . . automatic, not just for people with disabilities, but also for people with strollers. (OEM professional)

> . . . if we have a lower exhibit, it ends up being more accessible for someone in a wheelchair, but it's also . . . accessible to younger kids and that's . . . the angle we try to look in on it from. (LSM professional)

> So we also became enamored with the idea of universal design. That if we made an exhibit more accommodating to a wheelchair using visitor or a visitor with a hearing impairment, in fact that exhibit would work better for everybody. (UCM professional)

Even providing mobility aids is seen as a service that can benefit a broad range of users. Staff members acknowledge that aids such as wheelchairs are used by a broad range of individuals, even those who don't identify with having a disability such as someone with a temporary leg or knee injury. Staff members even associate this service with the provision of strollers: "We have wheelchairs [at] . . . the information booth that's right when you walk in. You can come and get those and strollers as well" (LSM professional). Older adults are also seen as a critical user group for mobility aids, especially at OEM where they provide a chauffeured golf cart for visitors who have difficulty walking long distances.

In addition to the practices that are employed to provide accommodations for visitors with disabilities that are also seen as being beneficial for other visitors, there are those practices where the inclusion of people with disabilities was not the initial goal behind implementation, but now these practices are perceived to have coincidental benefits for visitors with disabilities. These practices include the provision of ample seating, financial assistance/free admission, and multisensory interactives, which are all considered to be design elements that many individuals need, but are especially beneficial for people with disabilities. For example, hands-on and interactive exhibitions are included in science museums because of an overall educational philosophy that

emphasizes learning by doing, but as one professional at UCM states, "Because of the fact that our Museum is very hands-on, that . . . definitely helps people of all disabilities interact better with the Museum."

There are two consistently employed practices that are not perceived to be better for everyone: the provision of a service animal policy and providing accommodations for children with disabilities who participate in sign-up programs. There are challenges, however, with implementing and sustaining both of these practices. Although each museum has a service animal policy, the implementation of this policy is not effective at two of the museums. At LSM, senior management members and front-line staff members express different ideas about what the actual policy is, with the front-line staff members believing that documentation of service animal status is required and senior management stating that it is not. The policy at UCM, as one staff member reports it and is listed on the Museum's web site, is in direct conflict with the ADA policy for service animals that was instituted in 2010; the official UCM policy requires individuals to provide documentation that the animal is a service animal. These examples suggest that although having a policy is a consistent practice, successfully enacting and sustaining the policy is problematic.

Table 10

Commonalities in the Inclusive Practices across the Three Case Museums

Practices that are consistently or nearly consistently employed	Practices that are inconsistently employed	Practices that are not-at-all employed
• Service animal policy • Free wheelchairs and other mobility aids • Accommodations for sign-up programs • Elevators • Captioning • Ample seating • Attention to exhibit wheelchair access and other physical dimensions • Multisensory, interactive exhibits • Pathways easily navigable by wheelchairs • Financial assistance • Involving people with disabilities in work • Staff professional development	• Helpful staff • Interpretive images • Auditory interpretation • American Sign Language interpretation for programs • Wayfinding aids • Tactile cues in exhibitions • Labels with large, high-contrast fonts	• Food and drink policy • Exhibition and facility designs inclusive of individuals with intellectual disabilities • Communication with people with disabilities • Maintenance of accessible practices • Limited background noise • Attending to parents' ability to monitor children in exhibitions

Similarly, providing accommodations for children with disabilities who participate in sign-up programs also has its challenges. As described in the LSM case, there is an active internal debate about the degree to which the Museum should provide accommodations for children with disabilities who participate in this program. The success of the implementation of this practice is largely attributable to the actions of the individual who leads this program, and this practice also does not appear to be organization-wide. At UCM, staff members do not regularly ask parents if their children need special accommodations, but they do provide accommodations if requested; thus, asking if children need accommodations is not a regular or sustained practice.

In contrast to the challenges of implementing the practice of providing accommodations at UCM and LSM, there does not appear to be any debates about this practice at OEM, and it also appears to be consistently applied. Perhaps one reason for this difference is that the educators at OEM tend to think of this practice as one that benefits a broad range of children:

> One of . . . the most helpful things we've done recently is on our summer camp registration form . . . we would ask . . . something like "Please give us additional information about your child's learning style that might be helpful for our educators." So things like . . . if the child does have autism or if they have . . . sensory issues or any of those kinds of things, and hopefully they will offer us strategies to help. . . . Then we also get things that are . . . just

interests that a child has . . . "my child is really interested in this thing" . . . that has made a really big difference for us.

This difference between inclusion of OEM's sign-up programs and the other two museums' further supports the idea introduced earlier that practices perceived to be "better for everyone" or are viewed as having benefits for a wide range of individuals are more likely to be successfully implemented and sustained in science museums.

Commonalities between the inclusive practices that are inconsistently employed or not at all employed across the three museums. In addition to similarities between areas where consistent action is taken across the sites, there are also similarities in the areas where the case museums are inconsistent in their application of certain practices (meaning they implement these practices sometimes, but not always). There is also alignment in the practices and actions that are not substantially employed within the quintain (see Table 10).

Looking across the inconsistently or not-employed practices, the patterns connecting them are not readily apparent. There is a mixture of items—some are associated with enhancing access for individuals with sensory disabilities and others with enhancing access for people with intellectual disabilities. Other practices relate to providing access to the content of the exhibition (such as the graphic design of exhibition labels and ASL interpretation), while still others connect to visitor comfort (such as the availability of food and drink).

A review of the case data, however, does reveal certain relationships between these inconsistently or not-at-all applied practices. One immediate connection is that

visitors with disabilities describe these practices as necessary for inclusion, while staff members rarely mention them at all. This is especially true of the practices that are not applied at all, including issues related to the availability of food and drink, problems concerning background noise, difficulties parents experience as they try to monitor children with intellectual disabilities in exhibits, lack of maintenance of accessible interactives, and limited communication with people with disabilities about accessibility features. The absence of mentions during staff interviews implies that either staff members are unaware that these practices are needed, or at the very least, that the need for such inclusive practices is not top-of-mind for the participating professionals. One barrier, therefore, for the implementation and adoption of inclusive practices seems to be a lack of basic awareness of the need for such practices. Viewing this barrier through the lens of organizational learning suggests that one of the basic lessons organizations need to learn about is the needs, interests, and preferences of people with disabilities and a broad sense of the environmental conditions that will support their comfort and inclusion.

Lack of awareness and understanding of the need for certain practices, however, cannot account for all of the areas of inconsistency or inaccessibility. There are some practices where the need for a specific practice is known amongst the staff members, but is still not consistently implemented. Therefore, other factors are affecting the adoption of these practices.

For some of these practices, there is a discrepancy between what staff members think is a consistent practice and what visitors with disabilities actually experience at the museums. This disconnect, which is described as the difference between theory of action

and theory-in-use, is known to be problematic for organizational learning (Argyris & Schon, 1995; Schimmel & Muntslag, 2009).

One specific area where there is a difference between staff members' and visitors' perceptions is the availability of staff members to assist people with disabilities. Staff members' comments imply that this is a regular practice, but visitor observations demonstrate that either (a) staff members are not always consistently available or present when needed, or (b) staff members are not always well-trained on how to work effectively with visitors with disabilities. For example, at LSM, supervisory staff and floor staff agree that they "have very good training" for working with people with disabilities, yet visitor observations reveal negative interactions between people with disabilities and some staff members. After interacting with one staff member, a visitor who is a wheelchair user states that she "…felt left out of the experience. The counter was too narrow and my chair didn't fit underneath. The educator didn't try to engage me. It made me feel invisible. It was a very uncomfortable experience." Another lesson that organizations may need to learn, therefore, is a way to assess their work and practices so as to ensure that the practices that they know are needed are actually implemented and experienced by people with disabilities as initially envisioned.

The difference between staff members' and visitors' perceptions, however, only account for a portion of the inconsistently applied practices. There are also other practices where staff members are aware of the need for the practices, recognize that those practices are not adequately employed, but still feel they were not able to improve them. The inconsistent practice of providing auditory interpretation is one such example.

Each museum is inconsistent in its provision of auditory interpretation. The reasons staff members express for why this practice is not consistently employed vary. Some, especially at UCM, feel that the loss of the practice's champion (the former CEO) led to the practice's eventual decline. At OEM, however, where the Leader of Exhibits is a champion, the practice is still not always employed. This implies that the root cause is not lack of support by Senior Leaders.

At all three museums, staff members consider cost to be a factor. As one professional at OEM states, "We had less money so that caused the attention to [auditory interpretation to] drop and look at the most critical pieces." There are other inclusive practices, however, that cost money (such as captioning) that are consistently applied, so cost cannot fully account for the inconsistency in the implementation of auditory interpretation.

At both LSM and OEM, professionals state that one challenge with auditory interpretation is that they have not yet found an optimal solution for implementation:

> We began looking at other types of technology, mobile technologies, and we're starting to see that as an answer . . . [but] we haven't convinced ourselves yet that it's the way to go so it's caused us to get into a stall pattern. (OEM professional)

> I think the least standardized thing is delivering things in audio. Because headphones become maintenance problems and problematic, and if you do it all free air . . . it gets noisy and so

there aren't a lot of simple and elegant solutions. (LSM professional)

This suggests that even if a museum knows of a need for a specific practice, if they have not yet found a way to meet this need that they feel is optimal for their setting, it can affect the application of that practice.

Another possible explanation of why auditory interpretation is not consistently employed connects not to what staff members say, but to what they don't say; they do not associate auditory interpretation with benefits for a broad audience. Although prior studies show that auditory interpretation is used by individuals without disabilities in science museums (Hein & Heald, 1989; C. Tisdal, 2006) and that audio interpretation aids science museum visitors with a broad range of disabilities, including blind, low vision, and dyslexia (Reich, 2006b), staff members at these three museums discuss auditory interpretation almost exclusively as a need for only visitors who are blind or have low vision. The lack of priority for auditory interpretation, therefore, may reflect the lack of knowledge amongst staff members that this practice can be beneficial for many visitor groups.

Summary of the lens of the visitors with disabilities. Viewing inclusion through the lens of visitors with disabilities confirms one of the anticipated findings for this study—although the visitors with disabilities are largely positive about their experiences in these museums, they also face multiple barriers to full inclusion during their visits. Studying organizations that are known to have adopted inclusive practices, therefore,

affords the opportunity not only to study what facilitates organizational change toward inclusion, but also what impedes it.

Viewing inclusion through this lens provides a deeper understanding of what organizations need to learn to create environments that are inclusive of people with disabilities. At a very basic level, organizations should be aware of the environmental conditions that make the museum more welcoming, engaging, and comfortable for people with disabilities and that facilitate their learning. Organizations may also need to develop an understanding of how practices that benefit people with disabilities also improve the experience for people without disabilities as such an understanding appears to be linked to long-term sustainment and consistent implementation of inclusive practices. They might also benefit from learning how to assess whether the actual implementation of inclusive practices corresponds to what they know to be best practices, so as to ensure that the experience for people with disabilities is consistent with what they envisioned. Finally, organizations need to learn solutions for meeting the needs of visitors with disabilities that can be effectively implemented in museum environments.

The extent of the similarities in the practices that are employed across the three organizations is in itself remarkable. Although staff members mention learning from other museums or learning from industry publications during their interviews, this method of learning is not mentioned as frequently or strongly as some others (such as learning from people with disabilities, professional development programs, or experimentation). The extensive overlap in the inclusive practices of the three museums suggests that learning from other museums may play a stronger role in changing inclusive

practices than the participating staff members are even aware. Studies of change (or the lack thereof) in other kinds of institutions support this assertion. Such studies have shown that organizations within a certain field become more and more similar over time through a process called institutional isomorphism, where organizations seek solutions to challenges they face by looking at the practices of others within the same field (DiMaggio & Powell, 1983).

Institutional isomorphism cannot explain how the science museums have come to develop new practices, as the inclusive practices do need to originate from somewhere, and change took place at each of these museums over time. The question remains, how can organizations learn about inclusive practices? How do they learn not only about the needs and interests of people with disabilities but also about effective ways to implement practices that meet those needs? Also, what other lessons might organizations need to learn in order to sustain change toward practices that are more inclusive of people with disabilities? The answers to these questions can be revealed by examining these museums through the three remaining lenses.

Viewing Inclusion through the Lens of the People with Disabilities Involved in the Work of Science Museums

The people with disabilities who are involved in the work of the three case museums are boundary shifters; they are members of the local disability communities and organizational insiders. They speak both as people with disabilities who have firsthand experiences with the inclusive practices of the organization, and also as staff members, volunteers, or consultants who are knowledgeable about the internal mechanisms of the

museums. Viewing inclusion through the lens of these individuals provides a dual vantage point that cannot be afforded by looking at the three museums through any one of the other lenses alone.

The practice of involving people with disabilities extends across organizational areas and includes both paid and unpaid positions at each of the three museums. At OEM, people with disabilities serve as volunteers in multiple areas, including interpreting exhibitions and caring for the Museum's live animal collection. They also occasionally work as paid advisors or consultants for specific exhibition projects. At UCM, people with disabilities work as consultants, advisors, volunteers, and paid staff members and are particularly involved as On-the-Floor Educators. At LSM, the fact that the Museum regularly hires people with disabilities is a point of pride within the Museum, and people with disabilities work as paid staff members, paid consultants, paid advisors, and volunteers in a broad range of areas.

Overall, the people with disabilities who work at these three museums feel the organizations are committed to supporting the inclusion of people with disabilities:

> It just seems like everyone's welcome here . . . I [have] never seen any restrictions based on anyone's . . . life choices, be they religious or otherwise, or [the] diseases they have. (Seth, OEM volunteer who uses a wheelchair)

These individuals also feel that the museums take efforts to ensure they are personally included and welcomed in the work of the organization:

> I love working in this museum. . . . The people who work here . . . make me so comfortable. . . . They are willing to sign, they're willing to figure out how to work with me, they're willing to communicate with me and with Patty . . . it's wonderful. (Abby, UCM part-time staff member who is d/Deaf)

They also report that the museums' public spaces are largely inclusive of people with disabilities. For example, Oscar (LSM consultant who is blind) notes how the theaters at LSM have audio description, Abby and Patty (another part-time staff member at UCM who is d/Deaf) comment on the common practice of captioning at UCM, and Seth discusses how accessible OEM is from a wheelchair perspective. In this way, their comments about the museums align with the comments from visitors with disabilities participating in this study.

While their overall experience is positive, each individual encounters difficulties or barriers on occasion. Some of these barriers are the same as those faced by visitors with disabilities. For example, Abby at UCM struggles with the loud background noise as she works in the Museum's exhibit halls and Oscar at LSM experiences some difficulties working with staff members at the Museum's box office who are not always as aware as they should be of the Museum's accessibility offerings. These challenges suggest that attending to the needs of visitors with disabilities is also part of the process of making the museums more welcoming for the people with disabilities who are a part of the work.

While necessary, attending to the needs of visitors with disabilities is not sufficient for ensuring that people with disabilities are meaningfully, productively, and

comfortably involved in the organization's work. There are also certain challenges and barriers that are specific to the people with disabilities who work at the organizations. The lack of accessibility in some staff-only areas, at times, negatively impacts the experiences of people with disabilities who work at these museums. At LSM, a staff member who uses a wheelchair has difficulty navigating a cramped conference room. Seth's prior experiences at OEM, where it was difficult for him to work in one area of the Museum due to lack of accessibility on the staff-side of a programming space, is another example. It is important to note that these examples are rare, and for the most part, staff members with disabilities report that they find the museums largely accessible.

Another challenge unique to the people with disabilities who are involved in the work relates to how others within the organization assess their capabilities. This is particularly true for Abby and Patty at UCM, where both women feel they are capable of contributing more to the organization than they are currently empowered to do. For Abby, in particular, she feels an underestimation of her capabilities holds her back from being promoted and taking on more responsibilities within the department:

> I'm doing so much stuff, but I . . . want to try some other things, and I feel like I'm a little bit blocked or prevented from trying what I want to do in order to be promoted . . . I feel like I'm being pushed aside and . . . not being allowed to try the things other people are allowed to do so that they could be promoted.

While this problem is not often mentioned by other individuals with disabilities involved in the work of these museums, interviews with staff members without

disabilities further support the claim that adequately assessing the work capabilities of people with disabilities is a challenge. Staff members at UCM who do not identify as having disabilities talk about the challenges of figuring out what people with disabilities are capable of, not just related to Patty and Abby, but all people with disabilities who work or have worked as On-the-Floor Educators. At OEM, a Human Resources professional is working to ensure that the Museum is compliant with ADA and that all staff members apply thoughtful consideration when listing the required capabilities within a position description. Despite this effort, OEM staff members still have different conceptions about the kind of tasks people with disabilities can perform. For example, while one staff member feels that it would not be possible for her to hire a person who was d/Deaf due to communication difficulties, another staff member has already learned how to work with an individual who is d/Deaf and communicates effectively with him. This suggests that an additional lesson that needs to be learned by museums connects to an enhanced understanding of the capabilities of people with disabilities and how to work with them effectively.

Benefits of including people with disabilities in the work of the organization. Staff members at each of the three museums, including those with and without disabilities, provide multiple reasons for why they feel it is important that people with disabilities are involved in the organization's work. In some cases, such as the cafeteria volunteers at UCM and the Animal Care volunteers at OEM, the primary goal for involving people with disabilities is to provide them with a form of work-based therapy. In other cases, particularly in the area of exhibitions, all three museums specifically hire

people with disabilities to serve as consultants or advisors, providing the museums with input and feedback on ways to improve the design and content of these exhibitions so that they are more inclusive of people with disabilities. In still other cases, people with disabilities are hired to provide visitors with disabilities with a connection to the organization by seeing themselves reflected in the staff, a reason that is particularly cited for hiring educators with disabilities at the three museums.

The benefits of involving people with disabilities, however, extend beyond the initial reasons for the involvement. Across all three museums, people with and without disabilities who are involved in the museums' work report that this practice affords staff members the opportunity to learn about disability and inclusion. As the three case summaries describe, people with disabilities who work in these three museums report that staff members learn about inclusive practices by working and interacting with them:

> I know the guys downstairs in the workshop, they just love when I come down there, we have so much fun. Literally it's kind of fun 'cause I just blow their minds. (Oscar, consultant who is blind and works with LSM)

Staff members without disabilities make statements that align with this sentiment:

> I think we benefit from having a well-integrated workforce including people with disabilities in design, prototyping, education, public programming, and they're colleagues, friends and reviewers for other staff as other staff are for them. . . . We have daily

experiences with each [other]. (LSM professional who does not identify as having a disability)

When people with disabilities work as a part of a project team or consult with an entire department, multiple people within the same area report learning the similar lessons from that same individual. For example, multiple individuals at UCM, including those within and outside of the On-the-Floor Educator department, report learning about d/Deaf individuals, Deaf culture, and American Sign Language by working with Patty and Abby (who were On-the-Floor Educators at UCM and also d/Deaf). The same is true of Oscar, where multiple people within the Exhibits department at LSM, as well as professionals in other departments, report learning about inclusive practices by working directly with him on specific projects.

Multiple staff members at the three museums also report learning about disability and inclusion from individuals they know outside of work. The lessons learned from these experiences, however, tend to be personal and are not shared with others in the organization. The exception is at UCM, where at least two staff members who have relatives with disabilities are integrating these personal experiences into their work. One individual recently hosted a discussion at UCM on parenting children with autism. The other's relative worked at the Museum for a brief period of time and is also advising on the development of a new exhibition that addresses disability-related content. Here again, it is involvement in and connections to organizational work that appears to be associated with organizational learning. Therefore, it is the involvement of people with disabilities

in the work of the organization, not just knowing an individual with a disability that appears to be a critical part of an organization's learning process.

Summary of the lens of people with disabilities who are involved in the work of science museums. Similar to the experiences of visitors with disabilities, the people with disabilities who are involved in the work of these organizations report positive feeling about the inclusive practices of these organizations overall. These individuals feel that the museums value inclusion and take efforts to make the museum environments more accessible and inviting for visitors with disabilities and for the staff members, volunteers, and consultants who work there.

Not unlike visitors with disabilities, people with disabilities who work at these museums also describe some challenges and barriers related to inclusion. Some of the barriers could also affect visitors (such as the design of public spaces or the training of staff members), but some are unique to the individuals who work at these organizations. These unique challenges include the design of the workspaces as well as the need for staff members to improve their skills at assessing how people with disabilities can contribute to organizational work.

Staff members with and without disabilities cite a number of benefits that stem from involving people with disabilities in the organization's work. Some are benefits for the individuals with disabilities who work at the museums (such as volunteer work serving as a form of therapy) and others are benefits for visitor with disabilities who visit the museums (such as those who appreciate seeing themselves reflected in the organization's workforce).

From the staff's perspective, a key strength of involving people with disabilities in the work is the opportunity to learn about inclusive practices and disability by working directly with actual users. Across all three museums and a wide range of organizational areas, staff members describe the act of working alongside people with disabilities on a specific project or in daily practice as a critical part of the organization's learning process. Such interactions afford an opportunity for shared learning experiences that multiple staff members can draw upon when implementing inclusive practices. It also provides a mechanism for the individuals with disabilities to become part of the museum's sensemaking, and in this way, contribute to the organization's continuous change (Weick, 2000; Weick et al., 2005).

Viewing Inclusion through the Lens of Programs Known Internally for Their Inclusive Practices

At each museum, there is one particular program that is identified more than others as having a particular focus on the inclusion of people with disabilities; the type of program that is called out varies from museum to museum. The three programs (one at each museum) that staff members identify as being particularly inclusive include the following:

- The On-the-Floor Educators program at UCM, a program designed to make the museum more welcoming for visitors of diverse backgrounds through the presence of staff members in the Museum's exhibition halls who represent various cultural and community groups (including people with disabilities) and who are often bilingual (including American Sign Language);

- The Courses and Camps program at LSM, where children and families engage in summer and weekend courses about a variety of topics, and the staff members make specific accommodations for participating children with disabilities; and
- The Safety program at OEM, where staff members from across the organization come together to discuss safety issues that affect visitors and staff members, including safety procedures that particularly pertain to people with disabilities.

The fact that these programs are so different from one another yet share a strong focus on the inclusion of people with disabilities makes them a compelling lens for viewing the processes and conditions that can facilitate or impede organizational change toward the inclusion of people with disabilities in science museums. Similarities across these programs can be assumed to apply to programs at other science museums as well.

Similarities across the three programs. Review of staff member interviews as well as researcher observations reveal some consistencies in the processes that appear to facilitate change within each program. Two main similarities include a focus on professional development and on-going reflection. Both are discussed in more detail below.

Staff members report that each program has held and will continue to host multiple professional development offerings that address practices related to the inclusion of people with disabilities. These offerings tend to be conducted on-site and are attended by large groups of staff members:

> We have different sorts of drills, like a fire drill for example. We drill with people who might not be sighted, or somebody who's in

> a wheelchair, so that staff gets training on how to work with different populations. (OEM professional)

> We've also done workshops on working with people with Autism. So we had a presenter come in . . . to also tell about how to work with visually impaired individuals, just learning some key ways of understanding who the person is and how to interact with them. (UCM professional)

> We've done training for our instructors on different specific disabilities. We had the autism society come in and give a presentation. (LSM professional)

The individuals who lead the professional development offerings include both internal staff members and external experts. Who the external experts are varies. Sometimes they are people with disabilities, other times they are individuals who work for community organizations serving people with disabilities, and still other times they are individuals with a unique set of skill sets related to disabilities (for example, the fire department assisted OEM on a training related to evacuation procedures for people in wheelchairs).

Although a few staff members attend externally run or off-site professional development offerings on their own, such experiences do not tend to translate into broader organizational learning. It is mostly through participation in shared professional

development experiences that common understandings emerge. For example, at OEM, one staff member attended an industry-related workshop that discussed the universal design of public programs, but none of the other professionals at that Museum mention that workshop or its content (even if it is relevant to their work). In contrast, staff members from a broad range of organizational areas at OEM mention lessons learned through the professional development offerings of the Safety program.

In addition to formal professional development offerings, all three programs have a mutual practice of on-going reflection. Staff members at UCM, LSM, and OEM all report engaging in a process that they call "trial and error," where they respond to a need to make the environment more inclusive of people with disabilities by taking action, and then later reflect on the relative success of that action. If the action fails, they try another approach. If they succeed, they discuss why a particular approach works.

While the overall architecture of the process is the same across all three programs (identify a problem, try a solution, then reflect on its success), its implementation is different. Staff members affiliated with OEM's Safety program demonstrate reflection in the way they conduct their team meetings, regularly discussing and changing their decisions as a part of a group reflection process. For example, these staff members decide to bring in the fire department to train staff on ways to evacuate people in wheelchairs from the building after discussing staff reactions to a previous training where they were asked to role play the evacuation of a person in a wheelchair from the building's second floor. On-going reflection within the UCM On-the-Floor Educators program is described by the leader of this program as "making it work" by "just dealing with it [and] figuring it

out as it comes along." This is particularly true of their approach to hiring people with disabilities, where their decision to hire an individual often precedes their learning of how to work with people with particular disabilities. For staff members from the Courses and Camps program at LSM, the on-going reflection process focuses on trying out new approaches and receiving feedback from the children with disabilities who participate in the program. These staff members report that this process provides a meaningful learning experience:

> Really the learning happens when you sit down with a kid with autism and try and have a conversation with them and see how maybe you can pull them back into a conversation . . . it was important to be able to have the one-on-one experiences . . . have those conversations and having those safe spaces for us to discuss that is really important.

It is this last point that is consistent across the programs; regardless of what the on-going reflection process looks like, staff members from all three programs report it is an important part of their learning process.

Differences in experiences related to resistance of inclusion. While there are many similarities between these three programs, there is one substantial difference: both the On-the-Floor Educators program at UCM and the Courses and Camps program at LSM experience great internal resistance as they seek to become more and more inclusive, while the Safety program OEM does not. Leaders of both the On-the-Floor Educator program at UCM and the Courses and Camps program at LSM struggle at times

to make these programs as inclusive as they want them to be. At LSM, there is an open and on-going debate about the extent to which accommodations should be made for children with disabilities who register to participate in this program. At UCM, the dialogue is less overt, but the concerns are the same—how far is too far to go to make a program inclusive of people with disabilities? Such a dialogue is absent within OEM when it comes to the work of the Safety program. Exploring the reasons for organizational resistance to the changes in the UCM On-the-Floor Educator program and the LSM Courses and Camps program and comparing those reasons to the conditions surrounding the Safety program at OEM can provide insights on the kinds of factors that can impede change.

There are a number of differences between the two programs that meet resistance and the Safety program at OEM. One key difference is that the Safety program takes an embedded approach that incorporates accessibility considerations into existing activities, whereas the other two programs largely rely on an accommodations approach that emphasizes specialized practices for participants with disabilities. For example, as the case summary of OEM describes, each Safety program training session addresses issues that are relevant for people with disabilities. This practice suggests that the Museum expects that people with disabilities will visit, and they plan accordingly. Thinking about people with disabilities is not a special event that only happens occasionally or when they notice a person with a disability; it is consistently embedded into how this program operates. In contrast, the Courses and Camps program at LSM shifts its practices whenever a need for an accommodation arises. Each accommodation is conceived of

when requested by the participant, tailored to meet the needs of that participant, and then the staff members respond.

Closer examination of the Courses and Camps program provides evidence that this difference, of employing an accommodation as opposed to an embedded approach, may partially explain why the Safety program does not meet the same resistance as the other two programs. As the LSM case description notes, the Courses and Camps program addresses the inclusion of children with disabilities through two different mechanisms: (a) it modifies all programs to make them more inclusive of children with disabilities in a way that may also be helpful for some children without disabilities (employing practices such as posting timetables on the board for all children to see and keeping the amount of time spent in lecture short as compared to time in activities); and (b) it makes specific accommodations for individual children based on parental requests (such as eliminating all latex from program activities for children with latex allergies and offering to assist with toileting for children who are not able to do so on their own). It is the latter practice, of making specific accommodations for specific children, that faces resistance from other areas of the organization. While members of the organization frequently debate how far the program should go to accommodate particular children with particular disabilities, no one challenges the idea of modifying the programs to make them more inclusive of a broader range of individuals.

Another difference between the Safety program at OEM and the other two programs is that the Safety program is implemented by an interdepartmental team that includes representatives from multiple departments and divisions, whereas the other two

programs are run by one department. Given this, lessons learned through the Safety program have greater potential to be spread throughout the organization than the other two programs. For example, as described above, because it is a museum-wide effort, the Safety program's professional development offerings are implemented with all staff members, thus enabling inclusive practices implemented through the Safety program to be shared and disseminated throughout the organization.

The fact that the understandings of the Safety Committee regarding inclusive practices are shared throughout the organization may decrease the amount of resistance this program faces. In fact, the absence of a mechanism for sharing lessons learned across an organization is well-documented as a barrier that can impede organizational learning (Schimmel & Muntslag, 2009). OEM staff members in a broad range of areas demonstrate not only understanding, but also ownership of the practices that are discussed during Safety program trainings. For example, multiple staff members proudly pronounce during their interviews that they can say "Come with me, there is a fire!" in American Sign Language. In contrast, while staff members at LSM and UCM are aware of the fact that the Courses and Camps and On-the-Floor Educator programs are engaging in inclusive practices, they tend to view those practices as belonging to another group. Some staff members even express that they wish they knew more about the inclusive practices employed through these programs as they feel lessons learned in these areas could affect how they approach their own work.

> I think we haven't really addressed yet cognitive disabilities. I don't know if we have the expertise yet . . . I know [the Leader of

> the Courses and Camps program] is doing some great work with . . . Asperger's and . . . the spectrum disorders but . . . it's important . . . to figure out how do we make our exhibits . . . more accessible to people who have cognitive difficulties. (Exhibits professional, LSM)

It is worth noting, however, that although the Courses and Camps and On-the-Floor Educators programs do not involve the entire organization, the leaders of these programs are identified as champions or internal experts for inclusion by many in their organization. Some staff members consider these program leaders to be valuable staff members they can turn to for advice about their own inclusive practices. In this way, lessons learned in each of these programs are spread to other areas of the organization, but this is accomplished in a way that is more informal and ad hoc and, therefore, less consistent than that of the Safety program.

The role of the leader with regards to advocating for more inclusive practices is also different between the Safety and the other two programs. The leaders of the On-the-Floor Educators and the Courses and Camps programs are strong advocates for the inclusion of people with disabilities, working tirelessly in their efforts. Staff member interviews reveal that these leaders take many actions to make their programs more inclusive of people with disabilities, working extra hours to make specific accommodations, talking extensively with other staff members to convince them that the work of inclusion is worthwhile, and engaging in additional professional development programs to learn more about the inclusion of people with disabilities themselves. These

efforts not only make their own programs more inclusive, but also serve to inform others in the organization who report learning from their examples.

While the leaders are effective at changing practices within their own programs, their efforts do have a cost; it negatively impacts their energy and ability to be effective. During their interviews, these leaders report feeling exhausted and worn out from their efforts to make the programs more inclusive, stating at times that the situation is "too stressful." Although these leaders feel there are other staff members who work for the programs who also care about inclusive practices, both feel that the responsibility for inclusion rests on their shoulders. While it is unclear what is cause and what is effect (is it the reliance on one champion that makes the inclusive practices so hard to sustain? Or, do the leaders have to work so hard because there is so much resistance to their inclusive practices?), what is clear is that there is a relationship between the reliance on one champion to push the work forward and resistance to the inclusive practices; this relationship may have a negative impact on the sustainability of the work in the end.

There are two additional differences between the Safety program and the Courses and Camps and On-the-Floor Educators programs that are less likely to account for the unmet resistance of the Safety program's inclusive practices. The first is the fact that the Safety program is implemented by individuals who are all full-time staff members, whereas the majority of staff members implementing the other two programs are part-time staff members. While one could make the argument that full-time staff members often receive more professional training than part-time staff members and that communication breakdowns are more likely amongst part-time staff members and that

together these factors could affect organizational change, comparisons between the Courses and Camps and the On-the-Floor Educators programs suggest that this is not the case. While the Courses and Camps program reports difficulty training and communicating with part-time staff members, this is not a problem or concern for the On-the-Floor Educators program where there is extensive communication amongst staff members (using on-line resources such as Facebook) as well as elaborate, on-going training for full and part-time staff members. In addition, all staff members affiliated with the Safety program hold positions that are not focused exclusively on safety, and thus involvement in this program accounts for only a small portion of their job responsibilities. It cannot be stated, therefore, that the difference is the amount of time individuals spend implementing these programs.

Another difference between the Safety program and the Courses and Camps and On-the-Floor Educators programs is the fact that the Safety program does not extensively involve people with disabilities in its work. This sets the Safety program apart from almost all other areas across the three museums where inclusive practices have been initiated and sustained over time. There are many other areas within each of the three museums where people with disabilities are involved in the work and the practices are not met with resistance. Given this, it should not be concluded that the lack of involvement of people with disabilities is the reason why the Safety program's inclusive practices are supported, while the other two programs' practices are not.

The success of the Safety program despite this lack of involvement of people with disabilities could mean, however, that such involvement is not necessary for inclusive

practices to be successfully sustained. Here again, it is difficult to make such as claim as members of the Safety Committee report working extensively with people with disabilities in other areas of their work. So although people with disabilities are not involved in the Safety Committee, their input might indirectly influence the direction of this program through their involvement with staff members in other areas of the Museum's operations.

Summary of the lens of programs known internally for their inclusive practices. Exploration of the narratives of the three programs that are recognized internally for their inclusive practices (the Safety program at OEM, the Courses and Camps program at LSM, and the On-the-Floor Educators at UCM) reveals that certain practices—most notably engaging staff in shared professional development offerings and on-going reflection—facilitate the change toward more inclusive practices within these programs. These two practices are noteworthy as they encourage on-going learning about inclusive practices within a group of individuals, which in turn can support continuous change. The fact that these two shared practices are so similar across three very disparate programs also suggests that such practices would be effective at encouraging sustained change toward inclusion in programs at other science museums. It is also important to note that such practices are linked, as many scholars have proposed that purposeful and planned reflection is a critical strategy for professional development (Cochran-Smith & Lytle, 2009; Schon, 1983; Tran, Werner-Avidon, & Newton, 2013).

Both the Courses and Camps program at LSM and the On-the-Floor Educators program at UCM meet resistance from other organizational areas as they seek to employ

more inclusive practices. The Safety program at OEM does not face the same resistance. A few of the differences between these programs may account for organization-wide acceptance of the inclusive practices of the Safety program: (a) the Safety program employs an embedded accessibility approach, whereas the other two programs are more likely to follow a strategy of providing specialized practices for specific individuals with disabilities when such practices are requested; (b) the Safety program is led by a team that represents a broad range of areas within the organization, whereas the other two programs are implemented by particular departments; and (c) the Safety program's inclusive practices are not dependent upon the work of one individual, whereas the success of the inclusive practices in the other two programs is largely attributable to the advocacy efforts of the program leaders.

The relationship between embedded accessibility and sustainability connects with the picture that emerges through the lens of visitors with disabilities—non-sustained practices tend to be those that are seen as "specialized" or requiring an extra effort. The relationship between the resistance to inclusive practices and the latter two points above, that lack of dependency on one individual and the spread of an effort across an organization, aligns directly with the very definition of organizational learning, which is the evidence of shared thoughts, ideas, processes, and beliefs that extend across individuals. It is not surprising, therefore, that sustained change toward and lack of resistance for inclusive practices aligns with areas where there were opportunities for organizational learning (Huber, 1991; Levitt & March, 1988; Weick et al., 2005; Yanow, 2007).

Viewing Inclusion through the Lens of Exhibitions and Change Over Time

The lens of exhibitions provides a unique vantage point for viewing change over time. Given that exhibitions are updated or replaced rather infrequently (with many lasting 10 to 20 years), exhibitions currently in a museum serve as documentation of the changes in inclusive exhibition practices that have occurred over time. In addition, interviews with staff members reveal a fair amount of organizational longevity within the Exhibit departments of the three case museums. At each museum, multiple Exhibit professionals have worked at the Museum for over 20 years. The longevity of both the staff members and the exhibitions affords an opportunity to study change over time that is not consistently available through other organizational areas.

Across all three museums, the change that occurs in inclusive practices over time is not a steady, linear progression where the exhibitions become more and more inclusive with each passing year. Instead, visible changes appear episodically. There are periods of rapid incline where a group of new inclusive practices all develop at the same time, which are followed by plateaus where no new practices develop (or in some instances, some existing practices are not applied).

These punctuated periods of change coincide with the development of certain new exhibitions. At LSM, projects corresponding with change include a permanent exhibition on health, a traveling exhibition on sound, and two exhibitions that are installed at museums across the nation (one on math and another on current science). At OEM, such projects include two large outdoor exhibitions and another on math (created in collaboration with LSM). UCM's change-related projects include two specialized

technologies for people who are blind or have low vision, and more recently, a traveling exhibition that addresses content related to disability.

What is unique about these exhibition projects is not just that they are designed to be inclusive of people with disabilities, but also that new inclusive practices are introduced to or created by the organization through their development. These new practices (or at least a subset of them) are then applied to the development of future exhibitions. When the next inclusion-focused project comes along, the previously developed practices are integrated into its design, and then additional new practices are developed. With each new project, therefore, the museums expand their inclusive practices. In between these projects are the plateaus where no new practices are developed.

At OEM, for example, the first large outdoor exhibition (built in the early 2000's) includes a number of inclusive practices, such as audio to provide content in addition to text at select exhibit components; text labels with large, high-contrast fonts; exhibition paths and ramps at an incline appropriate for wheelchair users; computer kiosks with push button controls that are designed to be easily operated by an individual with limited dexterity or who is blind; tactile models; audio-based activities; and ample seating. The next outdoor exhibition includes many of these same options, with the addition of a few interactive and tactile exhibit components. The exhibition on math (built a few years later) features all of the inclusive design features from the outdoor exhibitions and also includes a number of multisensory interactive exhibit component experiences, greater use of images to facilitate interpretation (which in turn reduces the need for text-based

instructions), bilingual interpretation, and consistent use of audio interpretation at every exhibit component. It is important to note that the exhibitions built in between these three projects have some, but not all, of these inclusive features. A dinosaur exhibition built between the outdoor exhibitions and the math exhibition features tactile models, high contrast/large font labels, and level pathways, but no audio labels. A health exhibition built just before the dinosaurs again attends to wheelchair access through the design of its exhibit components and has high contrast/large font labels, but does not feature audio labels.

Characteristics of projects that correspond to changes in inclusive practices. As is evident in the above description of changes in inclusive exhibition practices over time at OEM, not every exhibition project at these museums leads to a substantial shift in the organizations' practices related to the inclusion of people with disabilities—only select projects do. Across all three museums, the projects that tend to correspond with a significant change in practices all share similar characteristics, which include the following:

- They are well-funded, with a substantial portion of funds from federal grants;
- The length of development is quite long, spanning multiple years;
- People with disabilities are specifically called out as a target audience;
- People with disabilities are involved in the work in a variety of ways, including as consultants, paid advisors, and formative evaluation participants; and
- They are highly visible within the organization and involve multiple departments.

These characteristics are important for considering how these projects serve to facilitate changes in the inclusive practices at each organization. The fact that these projects are well-funded and are developed over long periods of time enable them to provide staff members with the space they needed to innovate and develop new inclusive practices that have not been implemented at the museum before. In some cases, the science museum professionals are aware that there is a need for a particular inclusive practice, but do not feel they have the time or the funding to seek out this new practice until a large project comes along. For example, LSM had struggled to consider how they could deliver audio content to visitors who are blind or have low vision, and it was through the development of the traveling exhibition on sound that their new method for doing so was developed.

The provision of substantial funds and time for development, however, is not sufficient for facilitating organizational change related to inclusive practices. There are multiple projects that meet this criterion at each organization that do not correspond with a change in practice (such as a recently-created exhibition at LSM that does not include many of the inclusive features present in earlier exhibitions). However, when these projects call out people with disabilities as a target audience and the projects also involve people with disabilities in the work in a meaningful way, substantial shifts start to occur. When people with disabilities are called out as a target audience, the teams focus their energies specifically on creating innovations that make the exhibitions more inclusive of the target audience. When people with disabilities are not specified as a target audience,

this does not occur, nor are all of the existing internal innovations related to inclusive practices specifically applied to these exhibitions.

While the extra time and funding provides staff members with the capacity to innovate, it is the involvement of people with disabilities that enables the process of on-going experimentation, data-gathering, and reflection that is consistent with Huber's (1991) definition of experimental learning. Such a process is also reminiscent of the organizational learning process described by scholars (Argyris et al., 1990; Argyris & Schon, 1995; Preskill & Torres, 1999; Senge, 1990) who argue that action research is a critical mechanism for facilitating organizational change.

The people with disabilities who are involved in these projects play a significant role by providing project teams with feedback on how the newly developed innovations do or do not meet their needs. This feedback loop—whether it includes paid advisors/consultants or visitors with disabilities who participate in formative evaluations—is the mechanism through which staff members iterate changes to their designs. Oscar at LSM describes this process as follows:

> When we were working with different exhibits and how to make them work, it's like "Oscar, check this out, look what we did!" And they were all excited. "We can't wait for you to see how this one's working or what we did here!" And then they come back with something else and I go, "Oh, okay," and then they'll go, "Well, I'll go back and take care of that. Don't worry, we'll figure it out!" You know, it went through several different rounds of

> evolution, but [they were] never . . . really upset or disappointed. They were more like "Oh, okay," and they'd just go back and rework it and come back with it.

It is through this process of iterative designs that are tested with people with disabilities that staff members frequently report learning about inclusive practices. For example, one Senior Leader at OEM recalls how another Senior Leader learned about inclusive practices by working with people with disabilities:

> I think . . . he had told me once that when—and this was prior to me coming here—they had disabled members of the community serve as advisors on some of our planning for our exhibits in our outdoor areas . . . [it] really did have an impact on him . . . changing the way he viewed his job . . . designing exhibits. . . . He is not disabled himself, so he did not realize certain things going forward. After having those advisors, he fully embraced the idea of universal design.

Working closely with people with disabilities through these large-scale projects enables some professionals to take on informal leadership roles related to inclusion. There is at least one individual at each museum who is known as an "expert" or "champion" (and most of the time both) for inclusive practices who learned about inclusive practices through a project where he or she had worked closely with a person with a disability. At LSM, it is the individual who had worked on the sound exhibition. At OEM, it is the person who led the outdoor exhibition's development. At UCM, it is

the individual who is leading the creation of a new traveling exhibition that has disability-related content. More individuals are identified at each site, and each credits working with people with disabilities on a large scale project as one of the ways they learned about inclusive practices. These professionals continue to advocate for inclusive practices when developing current exhibitions and serve as internal resources for others who are seeking to employ inclusive practices on newer projects.

Another aspect of large exhibition projects that potentially contributes to organizational learning is the high-level of visibility they have amongst museum staff members. Large numbers of staff members representing a diverse range of organizational areas are often involved in the development and implementation of these projects. At each museum, staff members who were involved with one of these large projects in the past, regardless of whether they worked on aspects of the project related to inclusive practices, report that they are aware of the efforts the Museum took to make those previous exhibitions more inclusive of people with disabilities. Sometimes the project's visibility extends beyond just those who are immediately involved in the development and implementation, as information is actively shared across the museum about the inclusive practices when the exhibition opens. For example, after the opening of the outdoor exhibitions at OEM, staff members were trained on how to use these exhibitions with visitors and were specifically informed of the features that make these exhibitions more inclusive of people with disabilities.

Characteristics shared across some of the projects. In addition to the characteristics consistent across all exhibition projects where new inclusive practices are

developed, there are other characteristics that are shared across most, but not all projects. These include development through an inter-organizational collaboration (this is true for all projects except the health exhibition at LSM and the two outdoor exhibitions at OEM); and the embedment of accessibility into the design from the beginning of the project (this is true for all projects, except the two focused on specialized technologies for people who are blind or have low vision at UCM). By comparing the outcomes between the projects that did and did not exhibit these two characteristics, some additional understandings emerge about how project characteristics can affect change toward inclusion in science museums.

The role of external partnerships. All but the health-focused exhibition at LSM and the outdoor exhibitions at OEM featured external organizational partnerships as a part of the process of making the exhibition more inclusive of people with disabilities. According to the staff members who participated in the development of these projects, the external partnerships played a significant role in facilitating the development of new inclusive practices. For example, staff members at both LSM and OEM who worked collaboratively to develop the math exhibition with other museums across the nation report that the partnership model in this project shaped the inclusive practices that were carried out within this exhibition:

> When we had our kick-off meeting a year ago now, [a professional from another museum] did a presentation about accessibility and universal design just to make sure we were all thinking about it and put a bunch of resources up on our project wiki. Then, after we

> saw all the prototypes in September, [the same professional from another museum] scheduled a phone call with each project team to talk through some of the constraints and possibilities of each exhibit in terms of universal design. Out of that, we came up with some . . . really good ideas for two of the exhibits in particular—to add some touchable components and [audio labels], which is good because we hadn't really been thinking in that direction yet. (OEM professional)

At UCM, external partnerships play even more of an influential role in shaping the direction of the projects. Both of the specialized exhibition technologies developed for people who are blind or have low vision were created by external organizations. For one of these projects, a wayfinding system, the idea and funding all came from an external source. These projects, and especially the wayfinding system project, would not have come about it if weren't for the external partners.

Although the outdoor exhibitions at OEM and the health exhibition at LSM did not feature a formal partnership with an external organization as a part of the exhibition development process, both of these exhibitions did involve input from other organizations. At OEM in particular, the development of the outdoor exhibitions corresponded with the Museum's involvement in a professional development program that was offered by an industry organization. According to one long-term OEM Exhibits professional, the proximal relationship between the start of the development process for the outdoor exhibitions and the end of OEM's participation in the industry organization's

professional development program played a significant role in shaping the direction of the inclusive practices featured in the outdoor exhibitions: “We were already moving in this direction during the development of the outdoor experience . . . [we were] really fired up to find new ways to implement what we acquired in the accessibility workshop [offered by the industry organization].”

The above examples suggest that partnering with external organizations can contribute to organizational learning and a change toward more inclusive practices. It is worth noting, however, that not all partnerships contribute positively toward change and that the nature of the partnership may affect the shape of the change within an organization.

The role of the external partners for the two specialized technology projects at UCM was different from the role played by external partners for the new traveling exhibition under-development at UCM and from the role played by external partners for the exhibition projects at the other two museums. For the specialized technology projects, the external partners conducted most if not all of the work. This relationship may have contributed to the lack of sustainability of these projects—both of which have since been dismantled at UCM and have not been adopted or applied to any additional exhibitions.

Since the staff members did not carry out the implementation themselves, tacit understanding of how and why these technologies worked remains external to the organization. The external locus of control for the knowledge created a situation where a staff member needed to look outside of the organization to learn more about an internal

practice for a new project. One staff member reports that she learned about one of these technologies for the first time when she attended a session at a national conference.

Another negative side effect of external organizations conducting the work is that this can limit the interactions that take place between people with disabilities and internal staff members who are part of the effort. An external evaluator conducted the testing of the specialized technologies at UCM, and, therefore, there was no direct learning by staff members about how people with disabilities used and benefitted from these technologies. There is a general sense within the museum that these technologies were useful and valued by the community, but staff members cannot describe much detail about how people with disabilities used these technologies when they existed at the Museum. Although people with disabilities were involved in the experimentation process, the learning from that process (beyond the development of the innovation) did not become integrated into the organization's understandings in a way that could be applied to future work.

There is further evidence that some partnerships can have a negative impact on the organization's work. This comes from looking at the findings from the LSM case. This case describes how LSM frequently partners with many other science museums as a part of its work. Sometimes LSM creates exhibitions for other science museums, and other times exhibitions are created by other science museums and then exhibited at LSM. As detailed in this case, some of the organizations that LSM partners with for these endeavors do not think about or prioritize the inclusion of people with disabilities in their exhibition designs. As a consequence, LSM sometimes finds itself in a position of

needing to host or create an exhibition that does not meet their criteria for what they consider to be inclusive practices.

Looking across all of the partnership scenarios paints a detailed picture of the role partnerships can play in facilitating change toward inclusion. If the partnership features active participation by staff members internal to the museum and if the partners value the inclusion of people with disabilities, partnering with external organizations can contribute to a change toward more inclusive practices. If, however, internal staff members are not active participants in the project, a change may occur, but may not be sustained over time. Furthermore, if external partners do not value the inclusion of people with disabilities or are not knowledgeable of inclusive practices, the partnership can negatively affect a change toward inclusion.

Embedding accessibility into the design from the beginning. With the exception of the two projects at UCM that featured specialized technologies for visitors who are blind or have low vision, most of the exhibition projects that correspond with a change in inclusive practices were designed to be used by a broad audience that includes people with disabilities. Accessibility features built into these exhibitions are intended for use by visitors with and without disabilities. For example, the ramps that provide access to the outdoor exhibitions for people who use wheelchairs are generally understood by staff members at OEM to provide further access for mothers using strollers.

An "embedded" approach (as staff members at LSM and OEM refer to it), or what some might consider to be a universal design approach (Rose & Meyer, 2002; Story, Mueller, & Mace, 1998), is viewed favorably by staff members. At both LSM and

OEM, where this practice tends to be the norm, staff members frequently state that paying attention to issues related to accessibility for people with disabilities improves the experience or is useful for people without disabilities as well. While it is difficult to confirm whether it is the process of embedding accessibility into exhibition design that leads staff members to develop this conception or if staff members embed accessibility into exhibitions because of a belief that it is better for all, comments made by staff members suggest that it is the former—experience leads them to the idea that accessibility is better for all:

> Well, the statement that a lot of people say. . . "If we make things accessible, it's better for everybody" . . . I would say early on I was . . . fairly skeptical about that . . . I've learned that that's more or less true. . . . Going through projects . . . that has certainly been something that I've learned. (LSM professional)

Embedding accessibility into the work of exhibitions, as opposed to making specific accommodations later on or developing specialized technologies, is generally seen as a more sustainable and cost effective way of including people with disabilities, "You can either do it right the first time and start with the design phase . . . or you can pay a lot more on the tail end several years potentially down the road." (LSM professional)

At UCM, where two projects focused on creating specialized technologies for people who are blind, there is a general sentiment that the work of inclusion requires extra or additional funds. As one UCM professional states, "We can't specialize things

without specialized funding." This may partially explain why the audio tours developed for people who are blind have never been applied to any subsequent exhibitions—the costs of the audio tours are not built into the budgets of exhibition projects as this is seen as "specialized" work (not normal practice). In contrast to the two projects that feature specialized technologies, the new traveling exhibition that is being developed at UCM utilizes an embedded approach. Whether this project changes the staff members' conceptions regarding the financial sustainability of inclusive practices has yet to be determined.

Summary of the lens of exhibitions and change over time. When exploring how inclusive exhibition practices change over time at each of the three museums, what emerges is an image of episodic or punctuated change that corresponds to the development of certain new exhibitions. Exhibition projects that lead to change in inclusive practices share a common set of core characteristics (well-funded, long-term, specified focus on people with disabilities through embedded accessibility, involvement of people with disabilities, high internal profile, and collaborative) that enable organizational learning during the project's development through innovation, experimentation, access to external ideas, and large-scale communication about inclusive practices. These projects also foster the development of new internal conditions that lead to opportunities for on-going change, including the emergence of a culture that values the input of people with disabilities during exhibition development, a belief that inclusive practices are better for everyone, and internal champions/ experts who can inform and advocate for future work related to the inclusion of people with disabilities.

Viewing Inclusion of People with Disabilities Across the Lenses

Looking across the lenses and across all three museums provides an opportunity to re-examine the initial hypothesis from the literature review (Chapter 2) about the kinds, contexts, and processes of change identified through previous studies about change toward inclusion of people with disabilities in other organization types. By combining what is observed in the three case museums with findings from previous studies, a holistic image can be created for what change toward the inclusion of people with disabilities looks like in science museums.

Kinds of change. The initial literature review suggests that the kind of change that would appear at these three case sites would be broad and deep, meaning change would extend across organizational areas (and across organizational affiliations) and affect the organization's cultural values and beliefs. The change that is experienced by the museums in this quintain aligns with this initial prediction. Across these three museums, change toward practices that are inclusive of people with disabilities affects a broad range of organizational areas (educational programs, exhibitions, visitor services, human resources, amongst others) and feels genuine to different stakeholders. People with disabilities' (including those who visit and those involved in the work) have largely positive experiences at these museums; they consider these organizations to be welcoming, engaging, and comfortable, and there is evidence of physical, cognitive, and social inclusion. Staff members also agree that their organizations have taken many actions to make the museum environment more inclusive of people with disabilities.

The change toward the inclusion of people with disabilities, however, is neither pervasive nor consistent within these three museums. While there are certain actions and practices that are consistently taken across all three museums to make the environment more inclusive of people with disabilities, and there are other activities where implementation is inconsistent or non-existent. The presence and absence of action is also widespread. While certain areas of the organizations do appear to take more actions to make the environment inclusive as compared to others, there is no one area that is entirely inclusive nor is there one area that is uniformly inaccessible.

As findings from the literature review predict, the change at these science museums is deep and involves learning a number of lessons. Some lessons relate to the development of shared knowledge, awareness, and understandings, while others connect to changes in beliefs and values.

At each museum, there is evidence that staff members have developed an understanding of many of the needs, interests, and preferences of people with disabilities, and the corresponding actions museums can take to meet those needs. Learning about the needs of wheelchair users, for example, and what this means for the necessary height of interactives, the width of pathways through the gallery, and the provisions of rental wheelchairs is evident at each museum. The museum field's emphasis on the importance of this kind of knowledge is apparent in the numerous industry documents, resources, and Web sites that address it (American Association of Museums, 1998; Association of Science-Technology Centers, 2000; Majewski, 1987; National Assembly of State Arts Agencies, 2003; Reich, 2008; Smithsonian Accessibility Program, 1996). Such

understandings, however, are not sufficient for facilitating organizational change. A barrier can emerge when staff members are aware of the need for a certain practice, but are unsure of the best way to implement it in a science museum setting. This is true whether the concern is about making the environment more inclusive of museum visitors with disabilities in the public areas, as well as making the environment more inclusive of people with disabilities who are involved in the work through accessible staffing areas.

Furthermore, sustained change is more likely to come about when staff members also express a belief that specific practices for people with disabilities also benefit people without disabilities. When this belief is tied to a specific practice, the practice is less likely to meet resistance and more likely to be embedded within the work, and hence, be sustained over time. When a practice is viewed as being beneficial for only one particular audience, it is more likely to be viewed as costly, questioned by others within the organization, and considered a specialized practice; hence, such a practice is unlikely to be sustained over time.

The notion that practices employed to make an environment more inclusive for people with disabilities also improves the environment for everyone is not a new one. This is a central tenet behind the idea of universal design (Center for Universal Design, 2002; Rose & Meyer, 2002; Story et al., 1998) and is also one of the key messages used to frame the need for more disability rights legislation (Jeon & Haider-Markel, 2001). The idea that practices that are inclusive of people with disabilities can improve the experience for people without disabilities has also been documented as having validity through studies conducted in a variety of contexts (Danford, 2003, 2004; Johnstone,

2003). Some studies validating this idea have even taken place within science museums (Davidson et al., 1991; Reich, 2006a).

While the idea that accessibility can be better for everyone is not new, what is noteworthy about the findings from this study is that they point to a relationship between the practices that are consistently employed and sustained in science museums and those that are perceived by staff members to be "better for everyone;" this idea does not appear in studies included in the literature review. While some thought leaders have previously advocated that an approach that connects the needs of visitors with and without disabilities leads to longer-term sustainability of inclusive practices (Story, 1998; Story et al., 1998), there has been little prior documentation that there is a relationship between the two. Viewing this relationship through the lens of organizational learning reveals a need for staff members to develop the perception that practices that are beneficial for people with disabilities can also support people without disabilities, as this perception may positively contribute to sustained implementation of inclusive practices.

As this study was not designed to explore the relative effectiveness of universal design versus specialized designs for people with disabilities, it is difficult to say whether one of these strategies works better over another for people with disabilities. In addition, it is commonly accepted that the application of universal design does not lead to the elimination of accommodations, but rather a *reduction* in the need for accommodations. What the findings from this study do *not* suggest, therefore, is that the museums should no longer provide accommodations for visitors with disabilities. What findings from this study *do* suggest is that if staff members perceive that a specific inclusive practice has

broad appeal or benefits, they are more likely to sustain it. This then makes this practice more available for people with disabilities when they visit a museum.

Beyond what science museums need to learn about creating inclusive environments for disabilities, there visitors with is also a need for science museums to learn how to develop environments that are inclusive of staff members, volunteers, and consultants with disabilities who are involved in the work. One area where the three museums struggle is learning about the full range of capabilities of people with disabilities and the ways in which they can contribute to the organization. The need for greater clarity within organizations about what people with disabilities who are involved in the work of an organization are capable of achieving is not unique to museums, and has previously been identified as a barrier to inclusion in other sectors (England, 2003).

Contexts of change. In addition to eliciting greater understandings about the kinds of change that are present in the three science museums, looking across the lenses and across the cases also presents a picture of the context of change. Confirming the initial prediction set forth by the literature review, the change toward the inclusion of people with disabilities takes place within a context that is supportive of this particular change. Externally, each of these three museums has partners who are available to assist them in their inclusive practices and from whom staff members can learn. Internally, each organization has staff members who are knowledgeable about inclusive practices and are identified by others as individuals they can frequently turn to for help and advance. These individuals, however, were not experts before the inclusive practices began, but rather, became a part of the supportive context as they learned about inclusive practices through

the organizational change process. The existence of the Americans with Disabilities Act also appears to play a role, albeit limited.

In addition to knowledgeable internal individuals, each of the three organizations also has formal leaders who are supportive of practices that are inclusive of people with disabilities. Although the presence of these formal leaders cannot be detected by viewing the quintain through the four lenses, their positive and supportive attitude toward inclusion is evident in the case descriptions. What is noteworthy is that the role of the formal leaders is not discussed extensively above—this is because the change is rarely led by the museum's President, and they are not active players in the change process. However, they are a part of the context within which the change takes place, and, therefore, their potentially underlying supportive role should not be overlooked.

Beyond generating an understanding of the contexts that are supportive of change, the three case summaries also provide an image of the contexts that can impede change. When external partners and collaborators do not value or are not knowledgeable of inclusive practices, this can prevent change or action from occurring within the organization or otherwise contribute negatively to the inclusiveness of the museum. In addition, when external partners are not inclined to share ownership of the inclusive practices with the organization, this can detract from the organization's ability to learn through the partnership.

There is one initial hypothesis about the organizational context that does not reflect the observations of the three case museums. Findings from the initial literature review predict that change toward inclusion would only occur in a context that is absent

of internal conflicts or other stressors that prevent staff members from feeling safe to experiment and explore new ideas. Two of the three case museums are undergoing significant stress (layoffs, extensive reorganizations, large turn-over in personnel), yet, they still engage in an on-going and continual process of change toward inclusion. While this demonstrates that continued change can occur under stressful conditions, it is unclear if change in its earlier stages could have been initiated in this kind of organizational context.

Processes of change. As the findings from the literature review predict, change at the three museums is an on-going process that cannot be attributed to one specific event or occurrence. Instead, change occurs slowly and evolves over time, with periods of rapid growth followed by periods of slow change or no change at all. This picture of change is consistent with notions of continuous change put forth by Weick and Quinn (1999), which posits that organizations are never stagnant and that change occurs through the everyday workings of the organization as part of professional sensemaking. It is perhaps for this reason that the importance of embedding inclusive practices and the learning of inclusive practices in the everyday work of the organization (as opposed to setting it aside as a specialized practice) appears as a consistent theme through both the lens of change over time in exhibits and the lens of the particularly inclusive programs.

The change that occurs at these museums involves groups of individuals who work across organizational boundaries. Multiple individuals and departments are affiliated with "leading" the change within each organization, and multiple external partners are involved as well. The change is not top-down or planned. It does not stem

from a directive from the President or the Board of Trustees. Rather, it is unplanned and emergent, and results from the actions of individuals, departments, and project teams. This provides a rationale for the importance of communication around inclusive practices and the importance of involving multiple areas of the organization in the work. Through the inclusive programs lens, the organization-wide attributes of the Safety program (particularly the involvement of all staff members in the trainings) partially accounts for the lack of resistance this program faces for its inclusive practices as compared to the programs at the other two museums. Through the exhibits lens, one important aspect of large-scale projects that makes them effective at facilitating organizational change are the broad range of organizational areas that become involved in and are informed about these projects.

While it is tempting to assume that if the change had come about through a centralized plan or from a top-down directive it would be less piecemeal and more consistently applied, prior research as well as data from these three cases point to the fact that this may not be the case. Episodic change occurs even under conditions when the directive comes from above (Weick & Quinn, 1999). In addition, there is evidence that when a change stems from a top-down direction, it will not always be sustained in a science museum. At UCM, a former President initiated two noteworthy projects that made this museum more inclusive of people with disabilities, but these projects were not sustained after that President left the organization. In fact, as the lens of inclusive programs demonstrates, over-reliance on any one leader, whether that leader is formally

or informally designated as such, can negatively affect the long-term sustainability and organization-wide spread of practices that are inclusive of people with disabilities.

As the literature review suggests, change toward inclusion at these three museums emerges through a continuous learning process where the organizations test their ideas as they move forward. These three museums have learned *how to learn* about inclusive practices, employing a number of strategies that enable them to continue learning about inclusive practices over time.

Learning by involving people with disabilities in the museum's work is one of the key and central learning processes the three science museums employ that facilitates a change toward inclusion. It is a learning process that is clearly present in all three case descriptions and in each of the lenses for viewing the quintain.

The idea that working with people with disabilities leads to positive perceptions of disability has been long documented (Yuker & Block, 1986). The work of Yuker &Block (1986) suggests, however, that not all interactions are equal. When people with disabilities are in empowered positions, people without disabilities are more likely to develop positive notions of disability by working with them than if the people with disabilities were placed in a position of pity or need. The practice of employing people with disabilities at these three science museums corresponds with a position of empowerment; through their employment, these individuals are contributing to the work of the organization, their advice is being sought, and they are considered friends and colleagues. It is perhaps not surprising, therefore, that the practice of involving people

with disabilities in the work of the organization leads to positive learning about inclusion for science museum professionals.

It has also been frequently documented that working with people with disabilities leads individuals to adopt and feel more positively about inclusive practices, particularly in the area of science education (Bishop & Jones, 2003; Kirch, 2005) and science museums (Hein, 2002, 2003). However, although individual learning is a prerequisite for organizational learning, it is not sufficient. Organizational learning requires that knowledge becomes ingrained within the organization's memory and persists beyond the organizational lifespan of any one group of individuals (Levitt & March, 1988; Yanow, 2007). It is important to note, therefore, that the involvement of people with disabilities in the work of science museums appears to change not only individual understandings of inclusive practices but perhaps more importantly, organizational understandings. Across all three museums, multiple people from multiple organizational areas report learning similar lessons by working alongside people with disabilities. In addition, individuals who learn by working with people with disabilities on certain large-scale projects become known within their organizations as champions or knowledgeable experts of inclusive practices. Their presence within the organization then provides a continued mechanism for on-going learning.

Connected to the learning process of involving people with disabilities in the work of the organization, the three science museums have also learned how to learn about inclusive practices by engaging in a process of on-going reflection and experimentation. In many cases, this process involves feedback from people with disabilities (by involving

them in the work), but not always. Regardless of whether or not people with disabilities are involved, as the lenses of exhibits and of the inclusive programs demonstrate, multiple areas within these organizations engage in a cycle of identifying a problem, finding a solution, implementing it, gathering feedback, and reflecting upon this feedback as part of their process for developing more inclusive practices. The process of on-going experimentation and reflection is perhaps most present when these organizations undertake large-scale new exhibition projects. When such projects come about and focus on the inclusion of people with disabilities, they provide staff members with the time and space to innovate and create new inclusive practices that are refined through testing that takes place with people with disabilities.

The view of the lens of visitors with disabilities suggests that there is more each organization could learn through additional on-going assessment and feedback from people with disabilities. At each museum, there are specific needs and interests of people with disabilities that are not currently addressed in the museum that the staff members are not aware of. Working more closely with people with disabilities through a process of on-going reflection may enable such lessons to be learned. In addition, there are also areas where the actual experiences of people with disabilities differ from what the staff members expect it to be. Another lesson that organizations may need to learn, therefore, is a way to assess their work and practices so as to ensure that the practices that they know are needed are actually implemented and experienced by people with disabilities as initially envisioned. Such an assessment practice is consistent with theories of evaluative

inquiry that promote evaluation as a tool for organizational learning (Argyris & Schon, 1974, 1995; Russ-Eft & Preskill, 2001).

Although not a primary learning process, on-going professional development offerings are also mechanisms through which the organizations learn about practices that make science museums more inclusive of people with disabilities. People with disabilities are sometimes called in to facilitate such offerings, and in doing so, provide staff members with another avenue for learning from people with disabilities. These offerings are particularly valuable for organizations when they are embedded within existing trainings and feature organization-wide communication. These characteristics are true of the Safety program trainings at OEM (which are particularly effective at generating shared understandings), and also of the trainings that correspond with some of the large-scale exhibition projects.

Another process that plays a more limited role in facilitating change at these three museums is learning by working with other organizations that are knowledgeable about inclusive practices. Such learning processes in science museums appear to go beyond the mechanisms for learning from the external environment mentioned by Huber (1991), including vicarious learning (where organizations learn from observing the work of others) or the searching and noticing (where organizations seek out information from the external environment). Instead of passively learning from the lessons of others, science museums learn through active partnerships that feature deep involvement of external organizations. This finding is reminiscent of other studies that have examined change toward inclusive practices in non-profit organizations, which also found that connections

between organizations focused on similar goals can be a facilitator of change (Dodd, 2010; Hamner et al., 2008; Hein, 2002, 2003).

The enactment of the above strategies is what enables the organizations to continuously change and adapt over time, making each museum increasingly more accessible. By learning how to develop new strategies for inclusion and continually working to refine those strategies over time, these museums have learned how to be a learning organization (Argyris & Schon, 1995; Schimmel & Muntslag, 2009; Senge, 1990) when it comes to inclusive practices.

Limitations of the Quintain

As previously discussed in the methods section, this study has a number of limitations that affect the interpretation of the findings. One limitation is that the participating visitors are only those who self-identify as having a disability. Based on this limitation, the study is not able to make a link between sustainability of inclusive practices and whether those practices are "better for everyone." Instead, the connection that can be made is between the *perception* by staff members that practices are "better for everyone" and the sustainment of inclusive practices. This study also does not compare the effectiveness of certain kinds of inclusive practices. Therefore, it is also unknown whether practices that staff members perceive to be "better for everyone" are also better for people with disabilities, as compared to practices that are considered to be more specialized.

This study is also limited by its retrospective review of science museums after the change process had long been initiated. It, therefore, relies extensively on the recall and

memory of staff members. Therefore, there may be additional processes or contexts of change that influenced the organization's change toward inclusion over the years that staff members do not recognize and therefore are not reflected in this study.

The three science museums that are the focus of this quintain are also not representative of all science museums: these museums are exemplary with regards to their history of inclusive practices; are situated only in the United States; and do not reflect the smallest of science museums. Therefore, the findings from this quintain cannot definitively be applied to all science museums. However, due to the contextual similarities these science museums share with other science museums as well as the range of kinds of science museums represented in this quintain (the three museums are located in different geographic areas and focus on different educational strategies), what is learned from this quintain has implied meaning for other science museums who are seeking a change toward more inclusive practices. The implications of the findings from this quintain for other science museums are the focus of the next chapter.

Chapter 8: Conclusion

The three case study museums demonstrate that it is possible for science museums to be environments that are welcoming and inclusive of people with disabilities. The stories of these museums also provide narratives for the processes and contexts that facilitate a change within science museums and foster or impede the development of more inclusive practices. What the experiences of these three museums specifically point out is the need to view change toward inclusion not as a one-time endeavor or as the purview of one particular individual, but rather, as *an on-going process that is embedded within the work of a broad range of organizational areas*.

It is Possible for Science Museums to be Inclusive of People with Disabilities

Before describing the process that leads to change, it is important to note that the three museums that are the focus of this study appear to have been successful at creating an environment that is, to a large extent, inclusive of people with disabilities. People with disabilities who visit these museums report many examples of ways these organizations meet three critical aspects of inclusion—physical, cognitive, and social. The museums meet their physical needs by attending to design dimensions and architectural details that accommodate a broad range of users (such as providing parking spaces, elevators, and cane detectable pathways). These same institutions meet their cognitive needs by providing multisensory, multimodal exhibitions and programs from which visitors report learning. Finally, the three museums meet the visitors' social needs by creating an environment that enables them to participate in museum experiences alongside friends and family.

Although people with disabilities report an overall positive feeling about their experiences at these three museums, this does not imply that there is no need for further change. Visitors with disabilities still encounter barriers to full inclusion at each case museum. Some of these barriers connect to their physical comfort and well-being (such as strict "No food or drink" policies in the galleries). Others connect to lack of opportunities for content learning (such as the inconsistent application of audio interpretation in the galleries for visitors who are not able to/prefer not to read text). Still other barriers connect to a person's social inclusion (such as the fact that not all staff members are well trained with regards to how to interact with people with disabilities). There is a room, therefore, for these museums to continue to change and evolve over time and learn more about inclusive practices.

Actions Science Museum Professionals Can Take to Create Sustainable Inclusive Practices

From the stories of the individual programs and projects initiated at the three museums emerges a proposal for the kinds of actions science museums can intentionally employ as part of a planned change strategy that aims to create sustainable inclusive practices across the organization. Although these museums are unlike other science museums due to their exemplary adoption of practices that are inclusive of people with disabilities, these institutions do exhibit attributes that are common to many other science museums: they focus on hands-on and other forms of interactive learning; they belong to key industry organizations; they partner extensively with other science museums, local K-12 schools, and universities; their culture is visitor focused; they are funded through a

mixture of visitor-generated revenue, local government funds, and federal grants; and they all serve an audience that is a mixture of school groups, families, and sometimes adult-only groups. It is the exceptional nature of the inclusive practices of these museums that make them strong exemplars for others seeking change, and it is also the commonality with other science museums that make the lessons learned applicable to other organizations in the science museum field.

Although none of the three science museums has a planned strategy for organizational change related to inclusion, and it is beyond the scope of this study to test whether intentionally taking one series of actions would facilitate organizational change toward inclusive practices better than another, findings do point to a number of shared contexts and processes present across all three science museums that connect to sustained change toward inclusion. It is from these shared conditions and processes that potential actions for change emerge.

It is important to note that these museums have similar contexts that are supportive of organizational change toward the inclusion of people with disabilities. Internally, the cultures of these organizations are visitor or community focused, the CEOs are supportive of inclusive practices (but do not lead the change), and the work processes support collaborative work within teams and departments. Externally, there are community organizations, federal funding agencies, and other museums that provide knowledge of inclusive practices and, in some cases, exert pressure on these organizations to change. Within these three museums, however, there are both practices that were sustained and those that dissipated over time. This suggests that even within

contexts that are supportive of greater inclusion, certain actions are more likely to lead to sustainable change than others.

Action 1: Involve people with disabilities in the work of the organization. The stories of all three museums feature the practice of hiring people with disabilities to work at the organization as staff members, volunteers, consultants, and advisors. Staff members at each of these museums talk about hiring people with disabilities as an intentional practice aimed at creating a more equitable workforce within the organization. But their descriptions of the involvement of people with disabilities do not end there. They also discuss how working with people with disabilities has become a way that they learn more about inclusive practices.

The importance of involving people with disabilities in efforts to make environments more accessible has been emphasized by those within the disability rights community for over 30 years with "Nothing about us without us" being a core motto of the disability rights movement (Charlton, 1998). In addition, working with people with disabilities in a meaningful way—where they are in an empowered stance, afforded decision-making capabilities, and acknowledged for their expertise—has also been previously documented as a method for positively changing individual's attitudes toward the notion of disability (Yuker & Block, 1986). What this study further demonstrates, however, is that the involvement of people with disabilities is something more than the right thing to do or a way for individuals to learn—it plays a critical role in *organizational* learning and in the sustainment of inclusive practices over time.

Involving people with disabilities in the work of the organization provides for whole groups of staff members a real example of a specific person—a colleague—that they can think about when designing new museum programs and activities or are being inspired to take future actions. When that colleague is persistently present within the organization, he or she becomes a touchstone for other staff members, someone they refer to when making decisions about inclusive practices. Involving people with disabilities in the work shifts the notion of "inclusion" within the organizations so that it was no longer just an ideology intended for an abstract audience, but rather a specific practice aimed at improving the museum for real individuals—including one of their colleagues.

These experiences are so powerful that lessons learned by one staff member when working with a person with a disability are passed along to other staff members and become part of the organizational narrative. This is true even for staff members with one kind of disability who have the opportunity to work with individuals with other kinds of disabilities.

What is critical about the involvement of people with disabilities in the *work* of the organization is that it connects these individuals to project teams, whole departments, and sometimes the whole organization. While many people have personal experiences with individuals with disabilities outside the museum, and these personal experiences can lead to *individual learning*, such personal experiences rarely manifest themselves into organizational learning or a change in organizational practices. It is the direct involvement of people with disabilities in the work, particularly work that involves multiple staff members or whole teams or departments, that is critical.

There is one challenge museums face, however, as they integrate people with disabilities into the work of the organization—some staff members find it difficult to assess the capabilities of people with disabilities and develop a fuller understanding of the ways that people with disabilities can contribute to the organization. Differences in perceptions around the capabilities of people with disabilities exist between staff members with and without disabilities. Addressing this concern and helping staff members to fully understand the capabilities of people with disabilities is an important part of the effort of involving people with disabilities in the work of science museums.

Action 2: Reach a broad range of staff members by embedding information about inclusive practices into museum communications, professional development, and large projects. Implicit within the definition of organizational learning is that the understandings, values, and beliefs that emerge are organization-wide. It is not surprising, therefore, that efforts that reach a broad range of staff members are more likely to be associated with areas of organizational learning than others. Across the three organizations, there are multiple successful examples of how information about inclusive practices is shared throughout the museum. Such information is made available intentionally through professional development offerings that target all staff members (such as the monthly safety trainings at OEM that all staff members participate in) and through meetings that are attended by all staff members. Information is also spread through the organization when inclusive practices are embedded into large-scale projects that involve the work of a broad range of organizational areas. Although this practice is

unintentional for the participating museums, it could be employed as an intentional practice at other sites that are seeking a change toward inclusion.

Beyond simply providing a description of how one can share information across an organization, stories from these three cases also point toward the importance of making information available organization-wide. At a most basic level, people with disabilities use the entire museum when they visit or work there, and as the experiences of visitors with disabilities in this study demonstrate, barriers to inclusion can appear anywhere within the museum, even behind-the-scenes in the staffing area.

The need for organization-wide understandings extends past the need to make the entire museum accessible, however, and also connects to longer-term stability of inclusive practices. If the inclusive practices employed by one area of the museum are not valued throughout the organization, these practices can meet internal resistance, which in turn makes them harder to sustain. All museum areas depend on other areas of the organization to operate, and, thus, if one area does not support a specific inclusive practice, it can affect the sustainment of that practice in another area. For example, the inclusive exhibitions at OEM are not only designed and implemented by an exhibition design team, but also maintained by the exhibition maintenance team. At LSM, the inclusive practices of the Courses and Camps program depend not only on the knowledge and passion of the Program Leader, but also on the safety and employment policies of the larger organization, which determine the limits for the kinds of accommodations staff members can take to make programs inclusive of children with disabilities. Implementing

inclusive practices fully and sustainably, therefore, requires a shared understanding and commitment by all.

The story of LSM points to a further need to develop organization-wide understandings—when communication, information-sharing, and learning becomes fragmented, members of the organization can believe that inclusive practices are not valued by the organization and that those who take action are alone in their work. LSM staff members repeatedly report that the inclusion of people with disabilities is not valued by Senior Leaders of the organization, despite the fact that the Senior Leaders can cite multiple actions they have taken to make the museum more inclusive of people with disabilities. This difference in perceptions implies a lack of communication about inclusive practices within the organization. Many staff members cite the lack of communication about inclusive practices as evidence that it is not important to the museum and also state in their interviews that they are unaware of the work of others in the organization related to the inclusion of people with disabilities. Regular communication about inclusive practices, therefore, plays a critical role in supporting and sustaining inclusive practices by not only raising awareness, but also by supporting affective aspects of organizational learning and continually reinforcing the idea that the inclusion of people with disabilities is important to the museum.

Action 3: Engage in a process of on-going experimentation and reflection around inclusive practices. Consistent with theories of organizational learning from the business sector (Argyris & Schon, 1995; Huber, 1991; Senge, 1990) and from prior studies in the field of formal education that address change toward the inclusion of people

with disabilities (Ainscow, 2007; Ainscow et al., 2004), sustainable change toward inclusive practices emerges over time in science museums by embedding inclusion within existing work in a way that enables for on-going experimentation and reflecting upon what has been learned through trial. This process of experimentation and reflection often involves testing out new strategies (either formally through evaluations or informally through conversations and observations) with people with disabilities.

Although experimentation can occur slowly and over time, it generally follows a more punctuated pattern where specific events are connected with periods of substantial change. Such periods can take place during the development of a new large scale exhibition, the opening of a new building, or an extensive collaboration with an external partner (such as another science museum or community organization), and especially occur when the inclusion of people with disabilities is listed as one of the stated goals for the initiative.

These punctuated periods of activity are critical for supporting on-going work related to the inclusion of people with disabilities at the three museums. The change that takes place during these periods tends to go beyond small iterative adjustments to include large leaps in the overall approach, philosophy, or goals of the kind that is often associated with double loop learning (Argyris & Schon, 1974).

Staff members who work on these projects become highly knowledgeable about inclusive practices and subsequently become identified as internal champions for the inclusion of people with disabilities. These internal champions remind others within the organization about the importance of the work of including people with disabilities—and

sometimes achieve this by just being present at the table during crucial discussions. They are individuals whom multiple professionals from different areas of the organization recognize as someone they can readily access and approach when they are seeking help and advice for how to make the environment more inclusive of people with disabilities.

Action 4: Promote the idea that design strategies that benefit people with disabilities improve the museum experience for other audiences as well. The notion that designs intended for people with disabilities can improve the design for people without disabilities has been extensively advocated for by individuals who promote the use of universal design (Bowe, 2000; Rose & Meyer, 2002; Story et al., 1998) and has been proven to have merit by studies conducted within a variety of fields (Danford, 2003, 2004; Davidson et al., 1991; Johnstone, 2003; Reich, 2006b). Findings from this study further suggest that when organizations make a link between the benefits of certain inclusive practices for other audiences, those practices are more likely to be sustained.

When members of the organization think about inclusive practices as not just being for people with disabilities but for a broader range of visitors, the change becomes embedded within regular practice and becomes a part of how exhibitions, programs, or visitor services are developed for all visitors. Wheelchair access doors and ramps replacing stairs are acknowledged as being useful for moms with strollers, time-framed agendas are thought of as being useful for all children and especially those who are on the autism spectrum, and tactile activities are thought of as being for children as well as for people who are blind. This association between practices for people with disabilities and the notion of "better for all" seems to be an important part of the rationale the museums

present for continuing the practices and embedding them in the regular part of their work. It also appears to be integral to the development of the notion that including people with disabilities is just "part of what we do." When museum professionals share information with colleagues internally through professional development offerings or communicate about the other kinds of understandings organizations need to develop about inclusive practices (such as the needs and interests of people with disabilities and how to implement practices in science museums that meet those needs), it is important that connections are made to how such practices benefit a broad range of visitors.

In contrast, when inclusive practices become associated with the idea of being a specialized practice that is conducted specifically for people with disabilities, sustainability becomes a challenge. Staff members begin to think of such practices as "extra" and consuming money and time that a non-profit organization cannot afford. Such practices become debated within the organization, and even the strongest of champions find it hard to sustain them.

Summary of the four actions. While there were many shared processes and conditions across the three science museums, the above four actions are particularly important as they not only correspond with lasting change, they also continue to promote on-going learning and change. These four actions promote the development of a dynamic environment where efforts to learn about inclusion are not viewed as a one-time endeavor. Rather, these actions promote on-going organizational learning and sustainment of a focused effort on practices that are inclusive of people with disabilities within science museums by:

- concretizing the purpose of the aims of inclusion;
- developing staff members and volunteers who can serve as internal resources about inclusion for others in the organization;
- providing a mechanism for on-going feedback; and
- raising awareness of the importance of inclusive practices throughout the organization.

Need for Further Research

It is important to remember that the four actions cited above emerge from a retrospective look at change toward inclusion in three science museums. These actions, for the most part, are not identified as part of a plan for change by the three case museums. It is still unclear what the impacts would be if a science museum followed these four action items as part of a purposeful plan for change. Examining an organization over time as it enacts these and other actions as part of a planned change endeavor is a potential area for further research. It is also possible that there are other actions museums could take that would lead to more sustained and comprehensive changes within individual science museums. As this study describes, none of these science museums has yet to achieve widespread and sustained inclusion throughout all organizational areas. A further study could seek a comparison between those museums who employed the above stated actions and those who followed another plan of action for achieving their inclusion-related goals.

Another item to note is that these actions may have implications for a broad range of museum type, such as art museums, history museums, zoos and aquaria, and children's

museums. Given the overlapping contexts between science museums and these other kinds of museums (some shared funders, industry organizations, visitors, and local communities), it would not be surprising if actions that promote change toward inclusion in science museums also promote change in these other kinds of museums as well. There are potential differences between these other types of museums and science museums that may impact what are effective actions for change. For example, different museum types vary in the extent to which they are visitor-focused or support diversity as a core value. Given that both of these contextual factors play a role in supporting change at these three museums, it may be that different kinds of actions are needed to support change in these other kinds of museums. Exploring change toward the inclusion of people with disabilities in other kinds of museums beyond science museums is another area for further research.

Despite such limitations, this study does provide a view into the change toward inclusion in science museums through a lens that was not previously available. The science museum field has long known that it is possible to create museum learning environments that are welcoming and inclusive of people with disabilities (Friedman, 2000; Giusti, 2000; Hein & Heald, 1989; Reich, 2005; Reich et al., 2010). While previous work has extensively documented the actions science museums should take to make their environment more inclusive (such as how to design exhibitions, facilities, and programs (Reich, 2005; Reich et al., 2010), little was known about how to encourage museums to adopt and sustain such practices. Findings from this study point to actions that advocates, leaders, and other professionals seeking change can encourage within science museums

that will lead to lasting and on-going change. Such knowledge brings the science museum field one step closer to creating science museums that fulfill the ideal of being welcoming and inclusive of all.

References

Abraham, M., Griffin, D., & Crawford, J. (1999). Organisation change and management decision in museums. *Management decision, 37*(10), 736-751.

Ainscow, M. (2007). From special education to effective schools for all: A review of progress so far. In L. Florian (Ed.), *The SAGE Handbook of Special Education* (pp. 146-159). Thousand Oaks, CA: Sage Publications.

Ainscow, M., Booth, T., & Dyson, A. (2004). Understanding and developing inclusive practices in schools: A collaborative action research network. *International Journal of Inclusive Education, 8*(2), 125-139.

Ainscow, M., & Kaplan, I. (2005). Using evidence to encourage inclusive school development: Possibilities and challenges. *Australasian Journal of Special Education, 29*(2), 106-116.

Ainscow, M., & Miles, S. (2008). Making Educational for All inclusive: where next? *Prospects, 38*, 15-34.

Ainscow, M., & Sandill, A. (2010). Developing inclusive education systems: The role of organisational cultures and leadership. *International Journal of Inclusive Education, 14*(4), 401-416.

Allday, K. (2009). From changeling to citizen: Learning disability and its representation in museums. *Museums and Society, 7*(1), 32-49.

American Association of Museums. (1998). *Everyone's welcome*. Washington D.C.: Author.

American Association of Museums. (2000). *Code of Ethics*. Retrieved August 5, 2009, from http://www.aam-us.org/museumresources/ethics/coe.cfm

American Association of Museums. (2002). *Mastering civic engagement: A challenge to museums.* Washington, DC: American Association of Museums.

Argyris, C., Putnam, R., & McLain Smith, D. (1990). *Action science: Concepts, methods, and skills for research and intervention* (1st edition, 3rd printing ed.). San Francisco, CA: Jossey-Bass Inc., Publishers.

Argyris, C., & Schon, D. (1974). *Theory in practice: Increasing professional effectiveness*. San Francisco, CA: Jossey-Bass Publishers.

Argyris, C., & Schon, D. (1995). *Organizational learning II: Theory, method, and practice*: Prentice Hall.

Argyris, C., & Schon, D. (1999). The evolving field of organizational learning. In C. Argyris (Ed.), *On organizational learning* (2nd ed., pp. 1-15). San Francisco, CA: Blackwell Publishing.

Association of Science-Technology Centers. (2000). *Accessible practices*. Retrieved January, 2004, from http://www.astc.org/resource/access/index.htm

Association of Science-Technology Centers. (2008). *2007 ASTC Sourcebook of Statistics & Analysis*. Washington, DC: Association of Science-Technology Centers.

Baglieri, S., & Knopf, J. H. (2004). Normalizing difference in inclusive teaching. *Journal of Learning Disabilities, 37*(6), 525-529.

Barnes, C. (1998). The social model of disability: A sociological phenomenon. In T. Shakespeare (Ed.), *The disability reader: Social science perspectives* (pp. 65-78). New York, NY: Continuum.

Barnes, C. (2003). What a difference a decade makes: Reflections on doing 'emancipatory' disability research. *Disability and Society, 18*(1), 3-18.

Barton, L., & Armstrong, F. (2001). Disability, education, and inclusion: Cross-cultural issues and dilemmas. In G. Albrecht, K. Seelman & M. Bury (Eds.), *Handbook of disability studies* (pp. 693-710). Thousand Oaks, CA: Sage Publications, Inc.

Basham, J. D., Meyer, H., & Perry, E. (2010). The design and application of the digital backpack. *Journal of Research on Technology in Education, 42*(4), 339-359.

Bergey, J. L. (2008). "Life and Deaf": Language and the myth of "balance" in public history. *Sign Language Studies, 8*(4).

Bishop, A., & Jones, P. (2003). 'I never thought they would enjoy the fun of science just like ordinary children do'-- Exploring science experiences with early years teacher training students and children with severe and profound learning difficulties. *British Journal of Special Education, 30*(1), 34-43.

Blamires, M. (1999). Universal design for learning: Re-establishing differentiation as part of the inclusion agenda? *Support for Learning, 14*(4), 158-163.

Bonner, M. (2004). Organizational theory applied to school reform: A critical analysis. *School Psychology International, 25*(4), 455-471.

Bowe, F. G. (2000). *Universal design in education: Teaching nontraditional students*. Westport, CT: Bergin and Garvey.

Bricher, G. (2000). Disabled people, health professionals and the social model of disability: Can there be a research relationship? *Disability and Society, 15*(5), 781-793.

Brown, C. K. (2006). Museums and funders embracing new constituencies. *The Journal of Museum Education, 31*(1), 15-28.

Brown, S. C. (2001). Methodological paradigms that shape disability research. In G. Albrecht, K. Seelman & M. Bury (Eds.), *Handbook of disability studies*. Thousand Oaks, CA: Sage Publications.

Buyurgan, S. (2009). The expectations of the visually impaired university students from museums. *Educational Sciences: Theory & Practice, 9*(3), 1191-1204.

Campbell, J. (2000). Valuing diversity: The disability agenda-- we've only just begun. *Disability and Society, 17*(4), 471-478.

Candlin, F. (2003). Blindness, art and exclusion in museums and galleries. *The International Journal of Art and Design Education, 22*(1), 100-110.

Center for Universal Design. (2002). *Definition of universal design*. Retrieved November, 2002, from http://www.design.ncsu.edu/cud

Charlton, J. (1998). *Nothing about us without us*. Berkeley, CA: University of California Press.

Chin, E., & Lindgren-Streicher, A. (2007). Designing experiences that enable all visitors to learn. *Informal Learning Review*(85), 1-6.

Cochran-Smith, M., & Lytle, S. L. (1999). Relationships of knowledge and practice: Teacher learning in communities. In I. Iran-Nejad & C. D. Pearson (Eds.), *Review*

of research in education (Vol. 24, pp. 249-306). Washington, DC: American Educational Research Association.

Cochran-Smith, M., & Lytle, S. L. (2009). *Inquiry as stance: Practitioner research for the next generation*. New York, NY: Teachers College Press.

Cohen, O., & Heinecke, A. (2004). Scenes of Silence: An exhibition to break down mental prejudices. *Visitor Studies Today, VII*(III), 11-15.

Collinson, V., Cook, T. F., & Conley, S. (2006). Organizational learning in schools and school systems: Improving learning, teaching and leading. *Theory Into Practice, 45*(2), 107-116.

Danford, G. S. (2003). Universal design: People with vision, hearing and mobility impairments evaluate a model building. *Generations, 27*(1), 91-95.

Danford, G. S. (2004, December 7-12). *Assessing the benefits of universal design in fast food restaurants.* Paper presented at the Designing for the 21st Century, Rio de Janeiro, Brazil.

Davidson, B., Heald, C. L., & Hein, G. (1991). Increased exhibit accessibility through multisensory interaction. *Curator, 34*(4), 273-290.

Davis, J. M. (2000). Disability studies as ethnographic research and text: Research strategies and roles for promoting social change? *Disability and Society, 15*(2), 191-206.

Davis, L. (2001). Identity politics, disability and culture. In G. Albrecht, K. Seelman & M. Bury (Eds.), *Handbook of disability studies* (pp. 535-545). Thousand Oaks, CA: Sage Publications, Inc.

Davis, L. J. (2010). Constructing normalcy. In L. J. Davis (Ed.), *The disability studies reader* (pp. 3-19). New York, NY: Routledge.

Delin, A. (2002). Buried in the footnotes: The absence of disabled people in the collective imagery of our past. In R. Sandell (Ed.), *Museums, society, inequality* (pp. 84-97). New York, NY: Routledge.

Denzin, N. K. (1978). *The research act: A theoretical introduction to sociological methods* (2nd ed.). New York, NY: McGraw Hill.

Department of Justice. (2008). *Settlement Agreement between the United States of America and the International Spy Museum, DJ No. 202-16-130 (June 3, 2008)*, from http://www.ada.gov/spymuseum.htm

Diez, A. M. (2010). School memories of young people with disabilities: An analysis of barriers and aids to inclusion. *Disability and Society, 25*(2), 163-175.

DiMaggio, P. J. (1991). Constructing an organizational field as a professional project: US art museums, 1920-1940. In W. W. Powell & P. J. DiMaggio (Eds.), *The new institutionalism in organizational analysis* (pp. 267-292). Chicago, IL: University of Chicago Press.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147-160.

Dodd, J. (2010). *Redefining the role of botanic gardens--Towards a new social purpose*. Leicester, UK: Research Centre for Museums and Galleries, University of Leicester.

Dodd, J., Hooper-Greenhill, E., Delin, A., & Jones, C. (2006). *"In the past, we would just be invisible": Research into the attitudes of disabled people to museums and heritage Colchester Museums*. Leicester, UK: University of Leicester: Research Centre for Museums and Galleries.

Dodd, J., Sandell, R., Jolly, D., & Jones, C. (2008). *Rethinking disability representation in museums and galleries*. Leicester, UK: Research Centre for Museums and Galleries, University of Leicester.

Downing, J. E., Spencer, S., & Cavallaro, C. (2004). The development of an inclusive charter elementary school: Lessons learned. *Research and Practice for Persons with Severe Disabilities, 29*(1), 11-24.

Dudley-Marling, C. (2004). The social construction of learning disabilities. *Journal of Learning Disabilities, 37*(6), 482-489.

Dyson, A., Howes, A., & Roberts, B. (2002). *A systematic review of the effectiveness of school-level actions for promoting participation by all students (EPPI-Centre Review, version 1.1)*. London, UK: EPPI-Centre, Social Science Research Unit, Institute of Education.

Elieli, R. B., & Gould, L. J. (1995). Introduction. In E. H. Gurian (Ed.), *Institutional trauma: Major change in museums and its effect on staff*. Washington, DC: American Association of Museums.

Ellenbogen, K. (2007). *Remedial evaluation: Wild Music*. St. Paul, MN: Department of Evaluation and Research in Learning, Science Museum of Minnesota.

England, K. (2003). Disabilities, gender and employment: social exclusion, employment equity and Canadian banking. *The Canadian Geographer, 47*(4), 429-450.

Falk, J., & Dierking, L. (2000). *Learning from museums: Visitor experiences and the making of meaning*. Walnut Creek, CA: Alta Mira Press.

Fauske, J., & Raybould, R. (2005). Organizational learning theory in schools. *Journal of Educational Administration, 43*(1), 22-40.

Fisher, D., Sax, C., & Grove, K. A. (2000). The resilience of changes promoting inclusiveness in an urban elementary school. *The Elementary School Journal, 100*(3), 213-227.

Frankel, E. B., & McKay, D. (1997). Embarking on integration of preschool programs: Creating positive change. *Early Child Development and Care, 138*, 57-70.

Freund, P. (2001). Bodies, disability and spaces: The social model and disabling spatial organisations. *Disability and Society, 16*(5), 689-706.

Friedman, A. J. (2000). Expanding audiences: The audio tour access project at the New York Hall of Science. *Dimensions*, 7-8.

Fullan, M. (1995). The school as a learning organization: Distant dreams. *Theory Into Practice, 34*(4), 230-235.

Gherardi, S. (2000). Practice-based theorizing on learning and knowing in organizations. *Organization, 7*(2), 211-223.

Giles, C., & Hargreaves, A. (2006). The sustainability of innovative schools as learning organizations and professional learning communities during standardized reform. *Educational Administration Quarterly, 42*(1), 124-156.

Gill, C. J. (1999). Invisible ubiquity: The surprising relevance of disability issues in evaluation. *American Journal of Evaluation, 20*(2), 279-289.

Giusti, E. (2000). *Summative evaluation of audio guide for blind and low vision at the New York Hall of Science*. New York, NY: New York Hall of Science.

Giusti, E., & Landau, S. (2004). Accessible science museums with user-activated audio beacons (Ping!). *Visitor Studies Today, 7*(3), 16-23.

Griffin, D. (2008). Advancing museums. *Museum Management and Curatorship, 23*(1), 43-61.

Griffin, D., Abraham, M., & Crawford, J. (1999). Effective management of museums in the 1990's. *Curator, 42*(1), 37-53.

Griffin, J., Baum, L., Blankman-Hetrick, J., Griffin, D., Johnson, J., Reich, C., et al. (2007). Optimizing learning opportunities in museums: The role of organizational culture. In J. Falk, L. D. Dierking & S. Foutz (Eds.), *In principle, in practice: Museums as learning institutions*. Lanham, MD: Alta Mira Press.

Gurian, E. H. (Ed.). (1995). *Institutional trauma: Major change in museums and its effect on staff*. Washington, DC: American Association of Museums.

Hakala, K. (2010). Discourses on inclusion, citizenship and categorizations of 'special' in education policy: The case of negotiating change in the governing of vocational special needs in Finland. *European Educational Research Journal, 9*(2), 269-283.

Hamner, D., Hall, A. C., Timmons, J. C., Boeltzig, H., & Fesko, S. (2008). Agents of change in the disability field: Bridge-builders who make a difference. *Journal of Organizational Change Management, 21*(2), 161-173.

Hehir, T. (2002). Eliminating ableism in education. *Harvard Educational Review, 72*(1), 1-33.

Hein, G. (2002). *Accessible practices: Facilities and visitor services workshop summative evaluation*. Cambridge, MA: Lesley University, Program Evaluation and Research Group.

Hein, G. (2003). *Accessible practices: Interactive exhibits final summary evaluation report 1999-2002*. Cambridge, MA: Program Evaluation and Research Group at Lesley University.

Hein, G., & Heald, C. L. (1989). *User friendly exhibits: Dioramas for the 21st century*. Cambridge, MA: Lesley University, Program Evaluation and Research Group.

Hetherington, K. (2003). Accountability and disposal: Visual impairment and the museum. *Museum and society, 1*(2), 104-115.

Hevey, D. (2010). The enfreakment of photography. In L. J. Davis (Ed.), *The disability studies reader* (pp. 507-521). New York, NY: Routledge.

Hirsch, J. S., & Silverman, L. H. (Eds.). (2000). *Transforming practice: Selections from the Journal of Museum Education 1992-1999*. Washington, DC: Museum Education Roundtable.

Hirzy, E. C. (1992). *Excellence & equity: Education and the public dimension of museums*. Washington, DC: American Association of Museums.

Hollins, H. (2010). Reciprocity, accountability, empowerment: Emancipatory principles and practices in the museum. In R. Sandell, J. Dodd & R. Garland-Thomson

(Eds.), *Re-presenting disability: Activism and agency in the museum* (pp. 228-243). New York, NY: Routledge.

Honig, M. (2004). Where's the "up" in bottom-up reform? *Educational Policy, 18*(4), 527-561.

Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science, 2*(1), 88-115.

Humphrey, J. C. (2000). Researching disability politics, or, some problems with the social model in practice. *Disability and Society, 15*(1), 63-85.

Iacono, T. (2006). Ethical challenges and complexities of including people with intellectual disability as participants in research. *Journal of Intellectual and Developmental Disability, 31*(3), 173-179.

Imants, J. (2002). The counterproductive effects of a national reform initiative: Reflections from organizational theory. *School Effectiveness and School Improvement, 13*(1), 31-61.

Ingram, D., Louis, K. S., & Schroeder, R. G. (2004). Accountability policies and teacher decision making: Barriers to the use of data to improve practice. *Teachers College Record, 106*(6), 1258-1287.

Institute of Museum and Library Services. (2006). *Status of technology and digitization in the nation's museums and libraries*. Washington, DC.

Janes, R. R., & Conaty, G. T. (Eds.). (2005). *Looking reality in the eye: Museums and social responsibility*. Calgary, Alberta: University of Calgary Press.

Jeon, Y., & Haider-Markel, D. P. (2001). Tracing issue definition and policy change: An analysis of disability issue images and policy response. *Policy Studies Journal, 29*(2), 215-231.

Johnstone, C. J. (2003). *Improving validity of large-scale tests: Universal design and student performance (Technical Report 37)*. Minneapolis, MN: University of Minnesota, National Center for Educational Outcomes.

Karp, J., & Leblang, J. (2004). *Making Models: Summative evaluation report*. Cambridge, MA: Program Evaluation and Research Group at Lesley University.

Kavale, K. A., & Mostert, M. P. (2003). River of ideology, islands of evidence. *Exceptionality, 11*(4), 191-208.

Kirch, S. A. (2005). Inclusive science education: Classroom teacher and science educator experiences in CLASS workshops. *Inclusive science education, 105*(4), 175-196.

Kirk, J. (2001, March 15-17). *Accessibility and new technology in the museum.* Paper presented at the Museums and the Web, Seattle, WA.

Kozleski, E. B., & Smith, A. (2009). The complexities of systems change in creating equity for students with disabilities in urban schools. *Urban Education, 44*(4), 427-451.

Kugelmass, J. (2001). Collaboration and compromise in creating and sustaining an inclusive school. *International Journal of Inclusive Education, 5*(1), 47-65.

Landman, P., Fishburn, K., Kelly, L., & Tonkin, S. (2005). *Many voices making choices: Museum audiences with disabilities*. Sydney: Australian Museum and the National Museum of Australia.

Levitt, B., & March, J. (1988). Organisational learning. *Annual Review of Sociology, 14*(2), 319-340.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Newbury Park, CA: Sage Publications, Inc.

Lipsky, D. K., & Gartner, A. (1996). Inclusion, school restructuring, and the remaking of American society. *Harvard Educational Review, 66*(4), 762-796.

Longmore, P. K., & Umansky, L. (2001). *The new disability history: American perspectives*. New York, NY: New York University Press.

Majewski, J. (1987). *Part of your general public is disabled: A handbook for guides in museums, zoos, and historic houses* (2nd ed.). Washington, DC: Smithsonian Institution Press.

Mamlin, N. (1999). Despite best intentions: When inclusion fails. *The Journal of Special Education, 33*(1), 36-49.

March, J., & Olsen, I. (1975). The uncertainty of the past: Organisational learning under ambiguity. *European Journal of Political Research, 3*(1), 141-171.

Mawyer, R. (2005). The postmodern turn in disability studies. *Atenea, 25*(1), 61-75.

Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review, 62*(3), 279-300.

McDermott, R. P. (1996). The acquisition of a child by a learning disability. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context*. New York, NY: Cambridge University Press.

McDermott, R. P., & Varenne, H. (1995). Culture as "disability". *Anthropology and Education Quarterly, 26*(3), 324-348.

Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). San Francisco, CA: Jossey-Bass.

Miles, M., & Huberman, M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Mulford, B. (1998). Organizational learning and educational change. In A. Hargreaves, A. Lieberman, M. Fullan & D. W. Hopkins (Eds.), *International handbook of educational change* (pp. 616-641). Norwell, MA: Kluwer Academic Publishers.

National Assembly of State Arts Agencies. (2003). *Design for accessibility: A cultural administrator's handbook*. Washington, D.C.: Author.

National Research Council. (2009). *Learning science in informal environments: People, places and pursuits*. Washington, DC: The National Academies Press.

Newkirk, T. (1996). Seduction and betrayal in qualitative research. In P. Mortensen & G. Kirsch (Eds.), *Ethics and representation in qualitative studies of literacy*. Urbana, IL: National Council of Teachers of English.

Nind, M., Benjamin, S., Sheehy, K., Collins, J., & Hall, K. (2004). Methodological challenges in researching inclusive school cultures. *Educational Review, 56*(3), 259-270.

Ogawa, R. T., Loomis, M., & Crain, R. (2008). Institutional history of an interactive science center: The founding and development of the Exploratorium. *Science Education*, 270-292.

Onol, I. (2008). Tactual explorations: A tactile interpretation of a museum exhibit through tactile art works and augmented reality. In H. J. Chatterjee (Ed.), *Touch in Museums* (English ed., pp. 91-106). New York, NY: Berg Publishers.

O'Toole, G. (2007). Count me in: The role of action learning in making learning and skills provision more inclusive. *Action Learning: Research and Practice, 4*(1), 69-75.

Parrilla, A. (1999). Educational innovations as a school answer to diversity. *International Journal of Inclusive Education, 3*(2), 93-110.

Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage Publications, Inc.

Poria, Y., Reichel, A., & Brandt, Y. (2009). People with disabilities visit art museums: An exploratory study of obstacles and difficulties. *Journal of Heritage Tourism, 4*(2), 117-129.

Powell, D., & Hyle, A. (1997). Principals and school reform: Barriers to inclusion in three secondary schools. *Journal of School Leadership, 7*(May), 301-325.

Preskill, H., & Torres, R. T. (1999). *Evaluative inquiry for learning in organizations*. Thousand Oaks, CA: Sage Publications.

Ramcharan, P. (2006). Ethical challenges and complexities of including vulnerable people in research: Some pre-theoretical considerations. *Journal of Intellectual and Developmental Disability, 31*(3), 183-185.

Rapp, W. H. (2005). Inquiry-based environments for the inclusion of students with exceptional learning needs. *Remedial and Special Education, 26*(5), 297-310.

Reich, C. (2005). *Universal design of interactives for museum exhibitions.* Unpublished master's thesis, Lesley University, Cambridge, MA.

Reich, C. (2006a). *Universal design for computer interactives for science museum exhibitions.* Paper presented at the National Association for Research in Science Teaching Annual Meeting, San Francisco, CA.

Reich, C. (2006b, March 1, 2006). *Universal design of computer interactives for museum exhibitions.* Paper presented at the Museums and the Web 2006: Proceedings, Toronto.

Reich, C. (2008). *Guidelines for the universal design of public programs for science museums*. Boston, MA: NISE Network.

Reich, C., Lindgren-Streicher, A., Beyer, M., Levent, N., Pursley, J., & Mesiti, L. A. (2011). *Speaking out on art and museums: Study on the needs and preferences of adults who are blind or have low vision*. New York, NY: Art Beyond Sight.

Reich, C., Price, J., Rubin, E., & Steiner, M. (2010). *Inclusion, disabilities and informal science learning. A CAISE inquiry group report*. Washington, DC: Center for the Advancement of Informal Science Education (CAISE).

Rhoads, L. (2009). Museums, meaning making, and memories: The need for museum programs for people with dementia and their caregivers. *Curator, 52*(3), 229-240.

Riehl, C. J. (2000). The principal's role in creating inclusive schools for diverse students: A review of normative, empirical, and critical literature on the practice of educational administration. *Review of Educational Research, 70*(1), 55-81.

Roald, I. (2002). Norwegian Deaf teachers' reflections on their science education: Implications for instruction. *Journal of Deaf Studies and Deaf Education, 7*(1), 57-73.

Roberts, L. (1997). *From knowledge to narrative: Educators and the changing museum.* Washington, DC: Smithsonian Institution Press.

Robinson, V. M. J. (2001). Descriptive and normative research on organizational learning: Locating the contribution of Argyris and Schon. *The International Journal of Educational Management, 15*(2), 58-67.

Rodgers, P. (2005). *Managing access at the museum: Disability and institutional boundaries.* University of Toronto, Toronto, ON, Canada.

Rose, D. H., & Meyer, A. (2002). *Teaching every student in the digital age: Universal design for learning*. Alexandria, VA: Association for Supervision and Curriculum Development.

Russ-Eft, D., & Preskill, H. (2001). *Evaluation in organizations: A systematic approach to enhancing learning, performance and change*. New York, NY: Perseus Books Group.

Sandell, R. (2002). Museums and the combatting of social inequality: Roles, responsibilities, resistance. In R. Sandell (Ed.), *Museums, society, inequality* (pp. 3-23). New York, NY: Routledge.

Sandell, R. (2003). Social inclusion, the museum and the dynamics of sectorial change. *Museum and Society, 1*(1), 45-62.

Sandell, R., Delin, A., Dodd, J., & Gay, J. (2005). In the shadow of the freakshow: The impact of freakshow tradition on the display and understanding of disability history in museums. *Disability Studies Quarterly, 25*(4), 39.

Schimmel, R., & Muntslag, D. R. (2009). Learning barriers: A framework for the examination of structural impediments to organizational change. *Human Resource Management, 48*(3), 339-416.

Schon, D. (1983). *The reflective practitioner: How professionals think in action*. USA: Basic Books, Inc.

Schriner, K. (2001). Disability and institutional change: A human variation perspective on overcoming oppression. *Journal of Disability Policy Studies, 12*(2), 100-106.

Scott, W. R. (2003). *Organizations: Rational, natural and open systems*. Upper Saddle River, NJ: Pearson Education, Inc.

Scott, W. R. (2008). *Institutions and organizations: Ideas and interests*. Thousand Oaks, CA: Sage Publications.

Senge, P. (1990). *The fifth discipline: The art and practice of the learning organization*. New York, NY: Doubleday.

Shakespeare, T. (2010). The social model of disability. In L. J. Davis (Ed.), *The disabilities studies reader* (pp. 266-273). New York, NY: Routledge.

Simmons, B., Blackmore, T., & Bayliss, P. (2008). Postmodern synergistic knowledge creation: Extending the boundaries of disability studies. *Disability and Society, 23*(7), 733-745.

Simon, C., Echeita, G., Sandoval, M., & Lopez, M. (2010). The inclusive educational process of students with visual impairments in Spain: An analysis from the perspective of organizations. *Journal of Visual Impairment and Blindness, September*, 565-570.

Sindelar, P. T., Shearer, D. K., Yendol-Hoppey, D., & Liebert, T. W. (2006). The sustainability of inclusive school reform. *Exceptional Children, 72*(3), 317-331.

Singal, N. (2008). Working towards inclusion: Reflections from the classroom. *Teaching and Teacher Education, 24*, 1516-1529.

Skrtic, T. M. (1991). The special education paradox: Equity as the way to excellence. *Harvard Educational Review, 61*, 148-207.

Smith, S. R. (2001). Distorted ideals: The 'problem of dependency' and the mythology of independent living. *Social Theory and Practice, 27*(4), 579-599.

Smithsonian Accessibility Program. (1996). *Smithsonian guide for accessible exhibition design*. Washington, D.C.: Smithsonian Institution Press.

Sneider, C., & Burke, M. (2011). *The Legacy of YouthAlive!: Transformative Youth Programs Continue to Thrive in Science Centers*.

Solis, S. (2006). I'm "coming out" as disabled, but I'm "staying in" to rest": Reflecting on elected and imposed segregation. *Equity and Excellence in Education, 39*, 146-153.

Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.

Stake, R. E. (2006). *Multiple case study analysis*. New York, NY: The Guilford Press.

Story, M. F. (1998). Maximizing usability: The principles of universal design. *Assistive Technology, 10*, 4-12.

Story, M. F., Mueller, J. L., & Mace, R. L. (1998). *The universal design file: Designing for people of all ages and abilities*. Raleigh, NC: The Center for Universal Design.

Suchy, S. (2004). *Leading with passion: Change management in the 21st century museum*. Walnut Creek, CA: AltaMira Press.

Tangorra Matelic, C. (2008). Understanding change and transformation in history organizations. *History News, 63*(2), 7-13.

Tisdal, C. (2006). *Remedial evaluation of Star Wars: Where Science Meets Imagination*. St. Louis, MO: Tisdal Consulting.

Tisdal, C. E. (2007). *Summative evaluation of Star Wars: Where Science Meets Imagination*. St. Louis, MO: Tisdal Consulting.

Tokar, S. M. (2004). Universal design in North American museums with hands-on science exhibits: A survey. *Visitor Studies Today, 7*(3), 6-10.

Tran, L. U., Werner-Avidon, M., & Newton, L. R. (2013). Successful professional learning for informal educators: What is it and how do we get there? *Journal of Museum Education, 38*(3), 333-348.

Tregaskis, C. (2004). Applying the social model in practice: Some lessons from countryside recreation. *Disability and Society, 19*(6), 601-611.

Trent, S. C., Artiles, A. J., & Englert, C. S. (1998). From deficit thinking to social constructivism: A review of theory, research, and practice in special education. *Review of Educational Research, 23*, 277-307.

Vernon-Dotson, L. J. (2008). Promoting inclusive education through teacher leadership teams: A school reform initiative. *Journal of School Leadership, 18*(May), 344-373.

Wagner, M., Cadwallader, T. W., Marder, C., Newman, L., Garza, N., & Blackorby, J. (2002). *The other 80% of their time: The experiences of elementary and middle school students with disabilities in their nonschool hours*. Menlo Park, CA: SRI International.

Waldrop, J., & Stern, M. (2003). *Disability status: 2000*. Retrieved December 30, 2003, from http://www.census.gov/prod/2003pubs/c2kbr-17.pdf

Walmsley, J. (2001). Normalisation, emancipatory research and inclusive research in learning disability. *Disability and Society, 16*(2), 187-205.

Walters, D. (2009). Approaches in museums towards disability in the United Kingdom and the United States. *Museum Management and Curatorship, 24*(1), 29-46.

Weick, K. E. (2000). Emergent change as a universal in organizations. In M. Beer & N. Nohria (Eds.), *Breaking the code of change*. Boston, MA: Harvard Business School Press.

Weick, K. E., & Quinn, R. E. (1999). Organizational change and development. *Annual Review of Psychology, 50*, 361-386.

Weick, K. E., Sutcliffe, K. M., & Obstfeld, D. (2005). Organizing and the process of sensemaking. *Organization Science, 16*(4), 409-421.

Williams, G. (2001). Theorizing disability. In G. Albrecht, K. Seelman & M. Bury (Eds.), *Handbook of disability studies* (pp. 123-144). Thousand Oaks, CA: Sage Publications, Inc.

Yanow, D. (2007). Seeing organizational learning: A cultural view. *Organization, 7*(2), 247-268.

Yuker, H. E., & Block, J. R. (1986). *Research with the attitudes towards disabled persons scales*. Hempstead, NY: Center for the Study of Attitudes Toward Persons with Disabilities at Hofstra University.

Yuker, H. E., Block, J. R., & Younng, J. H. (1966). *The measurement of attitudes toward disabled persons*. Albertson, NY.

Zald, M. N., Morrill, C., & Hayagreeva, R. (2005). The impact of social movements on organizations: Environment and responses. In G. F. Davis, D. McAdam, W. R. Scott & M. N. Zald (Eds.), *Social movements and organization theory* (pp. 253-279). New York, NY: Cambridge University Press.

Appendix A: Focused Observation Guide for Visitors with Disabilities

1. Welcome the individuals to the museum and thank them for agreeing to participate
2. Describe the purpose of the research study
    a. Study of science museums across the nation and the actions they are taking to be more inclusive of people with disabilities
    b. This institution is part of this study
    c. Like to hear about this institution from your perspective: frequent museum visitors who have identified themselves as having a disability
    d. Important to discuss not only problem areas and barriers, but also strong practices that you think are particularly accessible or inclusive
        i. Identification of the problem areas or barriers will help this institution to improve its practices
        ii. Identification of strong or effective practices will make sure that this institution continues its good work, and that other museums can learn from such practices
3. Describe the process for the day:
    a. Two-hour activity
    b. Briefly meet
    c. Walk through the museum
    d. Discuss the museum experience together
    e. The discussion may be audiotaped–ask for permission

f. Ask if there are any further questions before we get started

Preparing for the walk-through.

1. Thank participants for coming
2. Introduce yourself to the group:
    a. Your name
    b. What you do at your museum
3. Ask participants to briefly introduce themselves:
    a. Name
    b. Why they came
    c. Their affiliation to the museum (member or non-member as well as how often they visit)
4. Before we begin our exploration of the museum, I'd like to hear your suggestions for areas that you think we should visit together as a group
    a. In particular, I'd like to hear your suggestions for areas that you think are particularly inclusive or welcoming for you and/or your family members
    b. I'd also like to know about the areas that you think are particularly problematic or pose barriers to full participation for you and/or your family
5. Given that we have a limited period of time here today, we are not going to be able to visit every area you might identify, but those we don't visit we can discuss together as a group after our walk-through. To figure out the areas that we will

visit together as a group today, what I would like to do is just hear suggestions from each of you and then determine from there what might be some high priority areas for us to visit

6. Let's start with _____
    a. What is one area you would like to show us today that you think is particularly inclusive, welcoming, or accessible?
    b. What is one area that you would like to show us today that is particularly inaccessible, unwelcoming, or poses barriers to participation for you or your family members?
    c. [Continue by asking each individual or group to identify a strong area and a problematic area]
7. OK, it sounds like _____ is an area that many of you think we should visit. So let's head there together and talk about it as a group while we are there. OR
    a. It sounds like there are many possible areas to visit. Does anyone have any preferences based on what you've heard here today? Does anyone have any areas that they specifically DO NOT want us to visit?
    b. We are probably not going to have time to visit _____. But we can talk about these areas together during our walk through later
8. [Group goes to the area decided upon. While there, I will take pictures of the problem areas and strengths that are pointed out by the visitors]

Museum walk-through.

- Look at the museum with the group, serving as a friend or guide
- Encourage the individuals to identify the barriers, then try brainstorming solutions together
- Encourage the individuals to share information about helpful or useful elements in the exhibition design
- Review the experience together, calling out exemplary designs as well as a prioritized list of needed changes
- Guiding questions:
    - Who is able to learn and who is unintentionally excluded?
    - What changes are needed to make the museum more inclusive?

Focus group questions. Thank you all for taking the time to walk through the museum together as a group and share with me some of your favorite and least favorite spots in the museum. It was very helpful for me to explore those areas with you. What I would like to do now is discuss the museum more generally. Let's start with some positive aspects of this particular museum.

1. Which, if any, parts of the museum do you think are particularly comfortable, welcoming, accessible or inclusive and why?
    a. Are there specific exhibitions that stand out for welcoming or inclusive?
    b. Programs?
    c. Facilities?
    d. Services?
    e. Staff?
    f. Website?
2. Where are some places where you've had an "aha" moment when visiting the museum where you came across a new idea, learned something new, or experienced something new or novel?
3. Which, if any, parts of the museum do you think are particularly uncomfortable, unwelcoming, inaccessible, or pose barriers to inclusion and why?
    a. Are there specific exhibitions that stand out as inaccessible?
    b. Programs?
    c. Facilities?
    d. Services?

    e. Staff?
    f. Website?

4. How does the accessibility or the inclusiveness of this museum compare to other museums that you've visited before?
5. How about to other public institutions?
6. What do you want me to tell the museum's management and the larger museum field about the accessibility and inclusiveness of this museum?
7. If you were made President of the Museum tomorrow, what would be the first thing you would fix about this institution to make it more inclusive of people with disabilities?
8. If you were President, which of the current practices related to inclusion would you make sure the Museum kept?
9. Is there anything else you think I should know about accessibility and inclusion related to this particular museum?

Thank you all for taking the time to speak with me today. **I'm passing around my business card.** If you have any further comments, questions, or anything else that you would like to share, please feel free to contact me. I'd be happy to speak with you further. Thank you again for all of your time and effort.

Appendix B: Museum Professional Interview Guide

Theme: Introduction. As we have previously discussed, I am conducting this interview as part of a larger research study examining organizational change and the inclusion of people with disabilities in science museums. This study will describe the range of actions taken (and also not taken) to include people with disabilities at three science museums where there has been sustained activity related to the inclusion of people with disabilities in museum learning. My hope is that this study will provide science museum professionals with new perspectives and understandings they can use to affect a change toward inclusion at their own museum. I would like to point out that I am interested in not only recording and sharing the success stories from the field, but also identifying areas where there is need for more improvement. What I will be looking for from this interview is to learn more about your perspectives of the processes that both promoted a successful change toward inclusion as well as those processes that prevent change.

A few words about the confidentiality of our interview:

1. Your participation in this study is voluntary. You can withdraw your participation at any point in time during the interview. Your manager will not be told of your participation, and, therefore, there will be no negative repercussions if you do not participate;

2. While the anonymity of the institution cannot be ensured, I will make every effort to protect your anonymity in the write-up of the results, using pseudonyms for both you and the program you represent;
3. If you feel uncomfortable with any question, you can decline to answer that question; and
4. If after or during the interview you feel uncomfortable about anything you shared, I can delete it from the record.
5. If you wish, you can read any descriptions I generate from our interview and review them to make sure that your description of the events is accurate and that your identity is sufficiently protected.
6. As described in the consent form you just signed, I would like to tape record this conversation for my records. Do I have your permission to use the recorder to record the interview?
7. Do you have any questions for me about the process before we get started?
8. Any questions about the reason for the interview?

Theme: Role as a museum professional. Transition sentence: To start the interview, I'm going to ask you a few questions about who you are and your museum career.

- What is your role here at the Museum?
- How many years have you been working here?
- Have you always held this position?

- Which museum departments do you tend to work with the most closely?
- Which individuals do you tend to work with on a regular basis (within those departments or in other departments)?
- Did you work at another museum before you came to this Museum?
    - Probe: What did you do before?

Theme: Description of inclusion at the Museum. Transition statement: So now I want to shift gears for a moment and talk about what you know about efforts [name of institution] has taken to create an environment that is more inclusive of people with disabilities.

- What are some actions your institution has taken to make your museum more inclusive of people with disabilities?
    - Can you provide examples of programs or exhibitions that you think are exemplary with regards to inclusion?
    - What are some actions you have specifically taken?
    - What actions have others at this institution taken to include people with disabilities in science learning that you think are particularly noteworthy?
    - How would you describe the relative success of you and your institution's efforts?
    - In what ways, if any, has the institution's action related to inclusion changed over time?

- What actions do you wish you or your institution could take to improve inclusion that you are not able to take for some reason or another?
    - Another way of thinking of this is that if you became President of the Museum tomorrow, what would be the first access or inclusion-related change you would try to make within your institution?
    - What do you think would be the benefit of that action?
    - What barriers stand in the way of you or your institution taking those actions right now?
- What are some common values or beliefs about inclusion that you think are shared amongst museum staff members around the issue of inclusion?
    - How would you describe your own personal beliefs or values related to inclusion, and do you think they are the same or different to what others in the Museum would be?
    - How do you think the institution's values or beliefs related to inclusion have changed over time?
- What are some of the key areas where you think there are some disagreements amongst staff members about the inclusion of people with disabilities?

Theme: Processes that led to inclusion. Transition sentence: Thanks for that information. It helped me to get a sense of the kinds of actions your Museum has taken to create an environment that is more inclusive of people with disabilities. What I would

like to do now is get a feel for the processes that led your institution to where it is today with regards to its stance toward inclusion.

- What do you think are the major changes that have taken place in the area of inclusion within your organization over time?
- How would you describe the process through which your institution moved from where it was to where it is today?
    - Have there been any events, experiences, professional development programs, or projects that you think were particularly effective at moving the institution forward?
    - Individuals who have served as champions?
- What lessons have you learned about inclusive practices over time?
    - Were there pivotal moments for you in terms of your learning about inclusive practices?
    - What are some activities that you've engaged in that have prompted you to change your thinking about inclusion?
    - Have you ever felt you learned something new based on:
        - Informal feedback from advisors, visitors, or consultants with disabilities?
        - Expert reviews from museum professionals?
        - Evaluations?
- To what extent would you describe the actions you take toward inclusion as being a collaborative versus an individual effort?

    - Do you think this is the same or different for others in your institution?
- What kinds of discussions do you have with others in your organization around issues of inclusion?
    - Brainstorming?
    - Problem solving?
    - Reflection/retrospective reviews?
- What kinds of sources have you or other individuals used to gather ideas or information for new inclusive practices or activities?
    - Other museums?
    - Other professionals?
    - Books, web sites, or other written literature?
    - Organizations outside the museum field?
    - Community organizations?
    - New staff members?
    - Advisors/consultants with disabilities?
    - Visitors?
    - Others?
- In what ways, if any, has the institution involved people with disabilities in its efforts to adopt more inclusive practices?
    - As consultants?
    - Advisors?
    - Visitors who review new projects?

    - Who are these individuals?
        - People with disabilities from outside the museum?
        - People with disabilities in the museum?
        - Museum professionals inside/outside the museum?
        - Professionals working in other accessibility-related professions?
        - University researchers?

Theme: Context of inclusion. Transition sentence: Before we conclude our interview, I have one further group of questions to ask you. This group of question relates more generally to the context of your institution as a whole and is not specifically related to inclusion. I'm just trying to get a feel for the general context within which this work takes place.

- Who are important stakeholders for the institution?
    - Community leaders?
    - Trustees and Overseers?
    - Funders?
- How would you describe the larger community within which the Museum is situated?
    - How, if at all, do these community characteristics influence what happens here at the institution?
- What, if any, policies or government agencies tend to influence the practices of the Museum?

    - Can you provide some examples of how those policies or agencies have influenced the actions of the Museum?
- In what ways, if any, does your Museum currently work with other museums?
    - How, if at all, do you think that work influences the actions of the Museum?
- Are there particular topics or areas within the Museum that tend to be a source of tension or conflict?
    - Financial stress?
    - Lack of trust between departments?
    - Differences in educational philosophies or views within the Museum?
- How, if at all, do you think the context of your institution as you just described it influences the actions your institution takes around inclusion?

Theme: Concluding remarks. Transitional sentence: We've reached the end of the interview. Before we conclude, I'd just like to ask you if there is anything else you would like to add to the discussion.

- Probe: Are there topics that you think are important that I forgot to address?
- Probe: If there is one idea you would like me to take away from this interview, what is it?

Appendix C: Observation Guide

Institution: __OEM ___UCM ___LSM

Researcher initials:

Name of the Meeting:

Day/Date/Time of Meeting:

Meeting Location:

Number of people observed:

Kinds of museum professionals present:

__Educators
__Exhibit developers/designers
__Marketing
__Human resources
__Facilities
__Visitor Services
__Managers
__Other:

Topics discussed:

Audience: __Y __N

__People with disabilities, specifically:
__Families
__Young children
__Adults
__School groups
__Other

Designs/practices aimed for a specific audience: __Y __N

Lessons learned over time: __Y __N

Institutional context: __Y __N

Design/development process: __Y __N

Focused observations during the meeting:

- What is the stated purpose of the meeting?
- What items are listed on the agenda?
- What topics are discussed?
- Was the topic of inclusion raised during the meeting? If so, what was said?
- Were there any designs or practices discussed during the meeting that have the potential to be either inclusive or not inclusive of people with disabilities?
- What was the major issue discussed?
- Was the issue resolved? If so, how?
- What is discussed about the institutional context?
- What is discussed about the processes through which the organization learns or makes decisions?

General notes, specific quotes, or other observations:

Observation Debrief. (To be completed immediately following an observation)

Kinds of change.

- What, if anything, was discussed about people with disabilities?
    - What, if any, issues or challenges were mentioned? If so, was it resolved and how?
    - What, if any, specific audiences were mentioned?
    - What, if any, specific designs or accommodations were mentioned?
    - What, if any, statements were made about what is "known" about people with disabilities as an audience?
- What else did you learn about the team's practices and thinking with regards to its audience?
    - Types of audiences considered and discussed
    - Perception and understanding of audience needs
    - Design elements or educational practices considered

Processes of change.

- What processes of change did you observe during the meeting?
    - Process for determining priorities
    - Process for designing and developing programs, exhibitions, or other educational experiences
    - Who is involved in or referred to during the discussions (specific people with disabilities, other museum professionals, visitors)

- Process for determining and reconsidering educational goals
- Process for experimentation or testing one's assumptions
- Process for gathering information about a specific problem or idea

Context of change.

- What did the team discuss about its context during the meeting?
  - Areas of contention/tension/financial stress mentioned
  - Organizational history mentioned
  - Local community mentioned
  - Government or policy mentioned

Documents.

- What documents were mentioned during the meeting that might be worth looking into during your visit?

Appendix D: Recruitment Emails

Suggested email for visitors with disabilities.

Dear Museum Member,

The [Name of host museum] is participating in a national study that examines the inclusion of people with disabilities in science museums. As part of this study, [Name of host museum] is inviting museum members who have disabilities to participate in a two-hour focus group at the museum. During this focus group, you will be asked to provide an outside researcher with information about how the design and practices of [Name of host museum] does and does not meet your needs as a person with a disability. Findings from this study will be used to inform both the future practices of [Name of host museum] and the broader science museum field as a whole.

If you are interested in participating as a part of this study, please contact [Name of primary contact person at host institution, email, phone number] to arrange a time to visit the museum. Thank you in advance for your help.

Sincerely,

[Name of primary contact, Name of host museum]

Suggested email for team observation request from institutional contact.

Dear [name of team-leader],

I'm writing to see if you would be willing to allow Christine Reich, Director of Research and Evaluation at the Museum of Science, Boston to sit-in and observe your team meeting on [Day, Date, Time]. Christine is conducting a national study that examines organizational change and the adoption of inclusive practices by science museums. Our museum is one of three museums across the nation that has been chosen to participate in this study.

This study will examine the processes and contexts that facilitate or pose barriers to more inclusive practices in science museums. As part of this study, Christine would like to attend various team meetings to learn more about how we work together at the [Name of Museum]. Her observations will be focused not only on how we discuss issues related to the inclusion for people with disabilities, but also on how we work together to address a range of issues related to visitors in general. Your team meeting is of particular interest to her study because [insert reason here].

During the meeting, Christine will serve only as an onlooker, and will not participate in the discussion. She will take written notes on what she observes, but will not audio record the conversations.

Please contact me and let me know if you do or do not feel comfortable having Christine observe your team meeting. If you feel this would be acceptable, Christine will follow-up with an email to the whole team to ensure that everyone is willing to be observed. If anyone in the group feels uncomfortable with this process, the observation would be canceled. If you have any questions or would like to learn more about the project, please feel free to get in touch with me or Christine (creich@mos.org, 617 589-0302). Thanks for your assistance.

Sincerely,

[Name of institutional contact person]

Suggested email for team observations from Christine Reich.

Dear [name of team],

I'm writing to follow-up on [Name of primary contact person's] request for me to observe your team meeting on [Day, Date, Time]. As [Name of primary contact] has already mentioned, I am conducting a national study that examines organizational change and the adoption of inclusive practices by science museums. Your museum is one of three museums across the nation that has been chosen for participation in this study.

This study will examine the processes and contexts that facilitate or pose barriers to more inclusive practices in science museums. As part of this study, I would like to attend various team meetings to learn more about how the members of your organization work together. My observations will be focused not only on how your organization relates to the issue of inclusion for people with disabilities, but also on how members of your organization work together on a range of issues related to visitors in general. Your team meeting is of particular interest to my study because [insert reason here].

During the meeting, I will serve only as an onlooker, and will not participate in the discussion. I will take written notes on what I observe, but I will not audio record your conversations.

If anyone on the team does not feel comfortable with me observing your team meeting, please contact me directly via email (creich@mos.org) or cellphone (### here). If anyone does not feel comfortable with the proposed observations, I will cancel the planned observation session and will not share the name of the individual(s) who contact me with anyone.

Thank you for your consideration.

Sincerely,

Christine Reich

Director of Research and Evaluation

Museum of Science, Boston

Suggested email for staff interview request from institutional contact.

Dear [individual],

I'm writing to see if you would be willing to be interviewed by Christine Reich, Director of Research and Evaluation at the Museum of Science, Boston so that she can learn about your perspective of inclusive practices at [name of institution]. Christine is conducting a national study that examines organizational change at science museums and the adoption of practices that are inclusive of people with disabilities. Our museum is one of three museums across the nation that has been chosen to participate in this study.

This study will examine the processes and contexts that facilitate or pose barriers to more inclusive practices in science museums. As part of this study, Christine would like to interview various staff members at [name of institution] to learn about similarities and differences in how we think about the inclusion of people with disabilities across the institution. For this reason, Christine is looking to interview individuals who work in various areas of the museum, including those areas where inclusion has and has not been directly addressed. We thought you might be an interesting person for Christine to interview because . . . [you can mention a specific project here, length of time at the museum, cross-cutting nature of the department, etc.]. The interview will last between 1 and 1.5 hours.

Please contact me and let me know if you would or would not be willing to participate in an interview with Christine. If you are willing, [say something here about how you might arrange the interview—through the museum's meeting software, via email, via Secretary?]. Christine will be visiting our museum [Dates of first visit] and [Dates of second visit]. If you have any questions or would like to learn more about the project, please feel free to get in touch with me or Christine (creich@mos.org, ### here). Thanks for your assistance.

Sincerely,

[Name of institutional contact person]

Appendix E: Consent Forms

Museum of Science®
Science Park
Boston, MA 02114-1099

Contact: Christine Reich
(617) 589-0302
creich@mos.org

Adult Visitor Participant Release Form

You are about to participate in a research study being conducted by the Museum of Science, Boston and Boston College. The purpose is to learn more about current science museum practices that are inclusive of people with disabilities, and about the processes and contexts that facilitate and pose barriers to organizational change toward inclusion. The end goal is to provide the museum field with information it can use to create more inclusive science museums in the future.

As a part of this research study, we are asking you (as a museum member or frequent visitor) to participate in a two-hour focus group where you describe your experiences in the participating museum. To help ensure that the researcher accurately captures your feedback, the focus group will be audio recorded. These audio recordings will only be shared with staff working on the project. You will never be identified by name in the audio tapes; every reasonable effort will be made to ensure that your ideas and feedback are kept confidential, and pseudonyms (made-up names) will be used. Quotes from these audio recordings may also appear in publications, although your name will never be associated with any comment that might appear in such publications. Please keep in mind, however, that any statements you make during the focus group will be heard by the other focus group participants. While we will ask the other focus group participants to treat all comments as confidential, we cannot guarantee that they will do so.

There may be unknown risks associated with your participation in this study. If you do not wish to participate or be audio recorded, please indicate so below. If you agree to participate or be audio recorded, you have the right to withdraw consent at any time. Please direct any questions, comments, or concerns about this project to Christine Reich at the Museum of Science using the contact information above. You may also contact Larry Bell, Senior Vice President at the Museum of Science (617-589-0282, lbell@mos.org), Patrick McQuillan, Associate Professor at Boston College (617-552-0676, mcquilpa@bc.edu).

This form was approved as part of Protocol 2011.03 under IRB Review and expires 2/21/2012.

Consent for Audio Recordings (check one)

❑ *Yes, I **agree** to be audio-taped and to have the audio recording used for research, publications, or other purposes as detailed in the letter above. I understand that I will not receive monetary compensation for the use of this audio.*

❑ *I **do not** agree to be audio-taped during this discussion.*

Printed Name: _____

Signature: _____ Date: _____

Email Address or Phone Number:_____

❑ *Participant has been provided with a copy of the consent form.*

This form was approved as part of Protocol 2011.03 under IRB Review and expires 2/21/2012.

Museum of Science®
Science Park
Boston, MA 02114-1099

Contact: Christine Reich
(617) 589-0302
creich@mos.org

Adult/ Child Visitor Participant Release Form

You and your child are about to participate in a research study being conducted by the Museum of Science, Boston and Boston College. The purpose is to learn more about current science museum practices that are inclusive of people with disabilities, and about the processes and contexts that facilitate and pose barriers to organizational change toward inclusion. The end goal is to provide the museum field with information it can use to create more inclusive science museums in the future.

As a part of this research study, we are asking you (as a museum member or frequent visitor) and your child to participate in a two-hour focus group where you describe your experiences in the participating museum. To help ensure that the researcher accurately captures your feedback, the focus group will be audio recorded. These audio recordings will only be shared with staff working on the project. Neither you nor your child will be identified by name in the audio tapes; every reasonable effort will be made to ensure that your ideas and feedback are kept confidential, and pseudonyms (made-up names) will be used. Quotes from these audio recordings may also appear in publications, although your names will never be associated with any comment that might appear in such publications. Please keep in mind, however, that any statements made by you or your child during the focus group will be heard by the other focus group participants. While we will ask the other focus group participants to treat all comments as confidential, we cannot guarantee that they will do so.

There may be unknown risks associated with your participation in this study. If you or your child do not wish to participate or be audio recorded, please indicate so below. If you agree to participate or be audio recorded, you have the right to withdraw consent at any time. Please direct any questions, comments, or concerns about this project to Christine Reich at the Museum of Science using the contact information above. You may also contact Larry Bell, Senior Vice President at the Museum of Science (617-589-0282, lbell@mos.org), or Patrick McQuillan, Associate Professor at Boston College (617-552-0676, mcquilpa@bc.edu).

This form was approved as part of Protocol 2011.03 under IRB Review and expires 2/21/2012.

1. Parent Consent for Audio Recordings (check one)

❑ *Yes, I **agree** to allow both myself and my child to be audio-taped and to have the audio recording used for research, publications, or other purposes as detailed in the letter above. I understand that neither I nor my child will receive monetary compensation for the use of this audio.*

❑ *I **do not** agree to allow myself or my child to be audio-taped during this discussion.*

Your Name (Please Print): _____

Your Child's Name (Please Print): _____

Parent or Guardian's Signature: _____

Date: _____

Email Address or Phone Number: _____

2. Child's (Age 7 or Over) Consent for Audio Recordings (check one)

❑ *Yes, I **agree** to be audio-taped and to have the audio recording used for research, publications, or other purposes as detailed in the letter above. I understand I will not receive monetary compensation for the use of this audio.*

❑ *I **do not** agree to be audio-taped during this discussion.*

Child's Name (Please Print): _____

Child's Signature: _____ Date: _____

Museum of Science®
Science Park
Boston, MA 02114-1099

Contact: Christine Reich
(617) 589-0302
creich@mos.org

Adult Professional Participant Release Form

You are about to participate in a research study conducted by the Museum of Science, Boston and Boston College. The purpose is to learn more about current science museum practices that are inclusive of people with disabilities, and about the processes and contexts that facilitate and impede organizational change toward inclusion. Study findings will highlight museum successes and areas for improvement. The end goal is to provide the museum field with information it can use to create more inclusive science museums.

We are asking you (as a museum professional) to participate in a one to two-hour interview where you describe your experiences working at the participating museum. To help ensure that the researcher accurately captures your feedback, the interview may be audio recorded.

This interview may have certain known and unknown risks. Known risks include the following: 1) you may say something during the interview that could be perceived negatively by others in your organization or the larger field; 2) you may feel participation is not voluntary; 3) you may feel the findings from the interview do not accurately reflect your experiences, attitudes, or actions; and 4) you may feel deceived regarding the intents and purposes of the study.

The following steps will be taken to reduce these risks:

1. You can voluntarily withdraw your participation in this study at any point. No one in your organization, including your manager, will be told if you chose not to participate;
2. If you feel uncomfortable with any question, you can decline to answer it;
3. If during or after the interview you feel uncomfortable about anything you shared, this statement can be deleted from the dataset;
4. Every reasonable effort will be made to ensure that the audio recordings, complete notes, or transcripts from your interview are kept confidential and not shared with anyone outside of the Museum of Science research team;
5. While excerpted quotes from the interview may appear in publications associated with this study, every effort will be made to protect your anonymity in these publications by using pseudonyms for both you and the program you represent (please keep in mind, however, that the anonymity of the institution cannot be ensured);
6. If you wish, you can review the descriptions generated from the interview to make sure that the description of the events is accurate and that your identity is sufficiently protected (the researcher maintains the right to make the final decision regarding the interpretation of the meaning of the described events); and

7. The study purpose will be described at the start of the interview and is stated at the beginning of this consent form.

If you do not wish to participate in this interview or be audio recorded, please indicate so below. If you agree to participate in this interview or be audio recorded, you have the right to withdraw consent at any time. Please direct any questions, comments, or concerns about this project to Christine Reich at the Museum of Science using the contact information above. You may also contact Larry Bell, Senior Vice President at the Museum of Science (617-589-0282, lbell@mos.org), or Patrick McQuillan, Associate Professor at Boston College (617-552-0676, mcquilpa@bc.edu).

1. Consent for interview (check one)

❑ *Yes, I **agree** to be interviewed for research, publications, or other purposes as detailed in the letter above. I understand that I will not receive monetary compensation for this interview.*

❑ *I **do not** agree to be interviewed.*

2. Consent for audio recordings (check one)

❑ *Yes, I **agree** to be audio-taped and to have the audio recording used for research, publications, or other purposes as detailed in the letter above. I understand that I will not receive monetary compensation for the use of this audio.*

❑ *I **do not** agree to be audio-taped during this interview.*

Printed Name: _____

Signature: _____

Date: _____

Email Address or Phone Number:_____

This form was approved as part of Protocol 2011.03 under IRB Review and expires 2/21/2012.